

# Instruction manual of lite version of the program "Multilingual local instrumental system of investments optimization, version 2.2" (LVP MLIS IO 2.2)

## Installing LVP MLIS IO 2.2

1. Copy to a separate folder of your computer disk space a set of files of LVP MLIS IO 2.2.
2. Check the composition of this set, which should include the following files:
  - boot file **Lite\_MLIS\_IO.exe** of the program;
  - boot file **GLS.exe** of the utility program of version 1.0 under the name "Генератор языковых оболочек (ГЯО 1.0) (Generator of language shells (GLS 1.0))", which allows to create language shells for LVP MLIS IO 2.2 interface;
  - contents of the folder **Data** — data files with extension "dat" for several already solved demonstration tasks, next to which will be placed data files for tasks to be solved by the user;

### *Note*

The installation set of LVP MLIS IO 2.2 includes 10 solved demonstration tasks, not available for removal, which are presented in two options: *Russian* ("DEMR11", "...12", "...21", "...31", "...32", "...33", "...41", "...42", "...43", "...44") and *English* ("DEME11", "...12", "...21", "...31", "...32", "...33", "...41", "...42", "...43", "...44"). Input and output data of these tasks you can look through on the screen, as well as bring out to Excel-files or print.

- contents of the folder **Dbsi** — files of the databases of sources of income (DBSI), which are of two types: unlimited and limited (in the first of them the numbers of sources of income available for purchasing are not specified, and in the second — are specified). The DBSI file has the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**. Besides, DBSI for tasks of the 4-th type also includes an additional data file (an addition) with the following name: **<type of tasks to be solved><database type>\_<database numeric code>\_<code of an addition (2 digits) #\_<three-digit code of language of the current program shell>.dat**;

### *Note*

The installation set of LVP MLIS IO 2.2 includes 18x2 files of 16 test DBSI of different types for all seven types of tasks that can be solved in the program. They are presented in two versions: *Russian* and *English*. Available for work is such group of these files which language is the same as the language of the program interface you have chosen, and which allow you to solve tasks of a type corresponding to the current localization mode of the program.

- contents of the folder **Excel documents** — files of table format Excel (with extension "xls"), in which the following may be stored:
  - initial contents of the databases of sources of income (subfolder **Databases** with nested folders **Rus** and **Eng**);
  - service information on presenting results of solving the tasks of forecasting parameters of securities (subfolder **Forecast for securities** with nested folders **Rus** and **Eng**);
  - input data of any existing tasks and output data of solved tasks (subfolder **Tasks** with nested folders **Rus** and **Eng**);

### *Note*

The installation set of LVP MLIS IO 2.2 includes the following Excel-files (in *Russian* and *English* options: 1) files with initial contents of all 16 test DBSI; 2) three service files of forecast for securities; 3) files with initial data for all 10 demonstration tasks. The first and third groups of specified files can be imported into LVP MLIS when creating new DBSI and new tasks.

- contents of the folder **Shells** — files of language shells for the current program interface;

### *Note*

The installation set of LVP MLIS IO 2.2 includes two files of shells for Russian and English languages: **Shell (IO 2.2).rus** and **Shell (IO 2.2).eng**.

- contents of the folder **Solving** — in this initially empty folder temporarily are placed data files for the tasks which are in the stage of solving;
- contents of the folder **System**:
  - **Config** — a configuration file, wherein is set a sign of the program localization in the case when in the process of operation the mode of its localization will not change;
  - **info** — a text file containing three main parameters of the used computer: processor type, clock rate and the volume of operative memory;
  - **Languages.txt** — a text file containing a list of possible language shells for the interface of this program;
  - **Programs.txt** — a text file containing names of those programs (including this one), for which may be created language shells by using the utility program ГЯО 1.0 (GLS 1.0);

- **protocol.ptl** — file of a protocol of tasks, being solved by the user, which holds general information about all existing tasks and their current state;
  - contents of the folder **User documents**:
    - files of three Russian-language documents in the subfolder **rus**:
      - **Инструкция по эксплуатации ГЯО 1.0.pdf**;
      - **Инструкция по эксплуатации ОБП МЛИС ОИ 2.2.pdf** ;
      - **Технические характеристики МЛИС-МСИС ОИ 2.2.pdf**;
    - files of three such English-language documents in the subfolder **eng**:
      - **Instruction manual of GLS 1.0.pdf**;
      - **Instruction manual of LVP MLIS IO 2.2.pdf** — file of this manual;
      - **Technical characteristics of MLIS-MNIS IO 2.2.pdf**.
3. If you want to set the *constant* mode of localization of the program LVP MLIS IO 2.2, which will not change during its operation, then do it in the service file **Config** using OS Windows by entering there a required sign of localization in the bottom line (the list of signs for the entire 12 modes of program localization is indicated there). Otherwise, you shouldn't do it (this line must be empty).
  4. Make changes in the **info** file using OS Windows, specifying there the actual settings of your computer: processor type, clock rate and the volume of operative memory.
  5. For ease of launching the program LVP MLIS IO 2.2, create a shortcut for its file **Lite\_MLIS\_IO.exe** and place it on the desktop of your computer.

## Run the program in operation

1. Click on the boot file **Lite\_MLIS\_IO.exe** of the program or on its label. At that happens the following:
  - in the absence in the folder **Shells** of any language shells files appears on the screen a warning message that the work in the program LVP MLIS IO 2.2 for this reason is impossible and it emergency closes;
  - in the presence in this folder of only one language shell file is launched the program, which interface is presented by the language of this shell;
  - in the presence there of two or more files of language shells happens transition to the next instruction item.
2. On the screen opens the window of the program LVP MLIS IO 2.2 without any records of its interface, and in its center appears a small dialog under the name **Selection of program interface language**. From the drop-down list of this dialog select desired language of program interface and click the button **OK**. At that, it closes and one of two things happens:
  - if you did not specify a constant mode of program localization in the file **Config**

(see the prev. section), then in the place of this dialog opens the information panel with a list of 12 program localization modes, and in the program window appears necessary records in the language which you selected. Choose the desired localization mode with a corresponding panel switch and click the button **OK** at the bottom of it. At that, the panel closes, at the top of the program window appear names of a mode of its localization and of a variety of sources of income, which you have selected, and the program itself becomes available for work;

- if you specified in the file **Config** a constant mode of program localization, then at the top of the program window appear names of a localization mode and of a variety of sources of incomes, which were selected, while the program itself becomes available for work.

## Operations with tasks

### Creating a new task with unique parameters

If in the new task of investment optimization the parameters of sources of income (SI) will differ from those of any other existing task, do the following:

1. Choose the command **Input⇒Input of a new task**, opening the dialog **Input of the task data (step 1)**, where do the following:
  - enter a six-digit cipher of the new task, which may include Latin characters and digits (first field of the dialog);
  - enter a name of this task (second field).
2. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 2)**, where do the following:
  - with the help of available for use switches of the dialog, select one of the *seven* possible types of tasks that are characterized by the following properties:
    - **type 1 of tasks:** 1) maximized parameter — absolute income from realizing SI; 2) SI with varying profitability — are absent;
    - **type 2 of tasks:** 1) maximized parameter — absolute income from realizing SI; 2) SI with varying profitability — are present; 3) option of realizing SI: via a certain period;
    - **type 3 of tasks (for piece goods):** 1) maximized parameter — absolute income from realizing SI; 2) SI with varying profitability — are present; 3) option of realizing SI — on their certain profitability; 4) option of accounting realization period SI: a) by its limitation or b) by setting its parameters; 5) number of same-type SI, acquired by one request — one; 6) payback factor: a) is absent, b) return on investment at the absence of initial SI or c) payback of the cost of initial SI at the absence of investment;

- **type 4 of tasks (for securities):** 1) maximized parameter — absolute income from realizing SI; 2) SI with varying profitability — are present; 3) option of realizing SI — on their certain profitability; 4) option of accounting realization period SI: a) by its limitation or b) by setting its parameters; 5) number of same-type SI, acquired by one request — all; 6) payback factor: a) is absent, b) return on investment at the absence of initial SI or c) payback of the cost of initial SI at the absence of investment;
- **type 5 of tasks:** 1) maximized parameter — relative income from exploitation SI; 2) SI with varying profitability — are present;
- **type 6 of tasks:** 1) maximized parameter — relative income from exploitation SI; 2) SI with varying profitability — are absent; 3) payback factor — is absent;
- **type 7 of tasks:** 1) maximized parameter — relative income from exploitation SI; 2) SI with varying profitability — are absent; 3) payback factor — return on investment; 4) option of behavior SI at initial sections of exploitation: a) a changing specific income from exploitation or b) random delay of the start of exploitation;

### **Note**

The further order of setting parameters of the task depends on its type (see above). Below are the seven possible options for the following actions on setting parameters, each of which corresponds to a certain type of a task being solved.

## **Order of setting the remaining parameters of a task of type 1, which is possible in the following program localization modes:**

### **1.1.1, 2.1.1, 3.1, 4.1.1 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
  - type of a database of sources of income that will be connected (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your task of type 1 (drop-down list);
  - if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

### **Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- interest rate on the loan (first field of the dialog);
  - number of investment options (second field).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify the following parameters for each investment option:

- involved amount of the investor's own funds (second field of the table);
- involved loan amount (third field of the table).

**Note**

In the first field of the table, which is not available for input and editing of information, is indicated a serial number of investment option.

5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5)**, in which specify the following parameters:
  - a possible sign of selecting a SI type in DBSI for this task (third from the right field of the table);
  - minimum number of being acquired SI samples (second from the right field of the table);
  - allowable number of being acquired SI samples (first from the right field of the table).

**Note**

In the remaining fields of the table, located on the left and not available for input and editing of information, is indicated information about the sources of income contained in the used DBSI.

6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the parameters of all SI that you selected in the previous dialog.
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**, in which specify the following parameters:
  - type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);
  - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
  - at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task cipher>\_in.dat**);

- select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

**Order of setting the remaining parameters of a task of type 2, which is possible in the following program localization modes:  
4.2.2 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
  - type of a DBSI that will connect (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your task of type 2 (drop-down list);
  - if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

**Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- interest rate on the loan (first field of the dialog);
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify the following parameters:
    - period of realizing of the acquired SI (first field of the dialog);
    - involved amount of the investor's own funds (second field);
    - involved loan amount (third field);
    - parameter for the first restriction on the investment risk, which is the upper threshold for the factors of variation of SI parameters;
      - number of values of this restriction (forth field);
    - parameters for the second restriction on investment risk, which is the factor of reducing the allowable amount of acquired SI with the maximum factor of variation (for SI of other types the values of such factors will be reduced by the program in proportion to the reduction of factors of variation for these SI):
      - minimum value of this restriction (fifth field);
      - maximum value of it (sixth field);
      - number of values (seventh field).

**Note**

Factor of variation of a random parameter is the ratio of its mean square deviation to the mean value.

5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5<letter character>)**, in which successively set the following parameters in several tables:

*Note*

Each of these tables refers to a specific distribution of parameters of SI profitability, and the transition between these tables occurs using the button **Forth**.

- a possible sign of selecting a SI type in DBSI for this task (third from the right field of the table);
- minimum number of being acquired SI samples (second from the right field of the table);
- allowable number of being acquired SI samples (first from the right field of the table).

*Note*

In the remaining fields of the table, located on the left and not available for entering and editing information, is indicated the information about the sources of income contained in the used DBSI.

6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the parameters of all the SI that were selected in the previous dialog. These parameters are formed in the following way from the contents of tables of the previous dialog: instead of parameters of the given distribution of a random value of SI profitability are specified mean values and factors of variation of this profitability.
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**, in which specify the following parameters:
  - type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);
  - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
  - at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task ci-**

**pher>\_in.dat**);

- select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

**Order of setting the remaining parameters of a task of type 3, which is possible in the following program localization modes:  
3.2 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
  - type of a DBSI that will connect (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your task of type 3 (drop-down list);
  - if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

**Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- in the absence of a payback factor:
    - interest rate on the loan (first field of the dialog);
    - number of investment options (second field);
  - at payback factor for the consumed amount of investment in the absence of the initial SI:
    - interest rate on the loan (field).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify the following parameters:
    - in the absence of a payback factor:
      - for each investment option:
        - involved amount of the investor's own funds (second field of the table);
        - involved loan amount (third field of the table);

**Note**

In the first field of the table, which is not available for input and editing of information, is indicated a serial number of investment option.

- at payback factor for the consumed amount of investment in the absence of the initial SI:

- involved amount of the investor's own funds (first field of the dialog);
  - involved loan amount (second field);
  - payback period of investment (PPI) (third field);
  - maximum value of a payback factor during PPI of the consumed amount of investment (forth field);
  - minimum value of this factor (fifth field);
  - number of its values (sixth field);
  - at payback factor for the cost of initial SI in the absence of investment:
    - cost of all initial SI (first field of the dialog);
    - maximum value of a payback period of investment (second field);
    - minimum value of PPI (third field);
    - number of its values (forth field);
    - factor of payback during PPI of the cost of all initial SI (fifth field).
5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5)**, in which specify the following parameters:
- under restricting the period of realization of the acquired SI:
    - allowable period of their realization(field of the dialog);
    - mode of clearance sale with markdown of remaining SI (left switch) or its absence (right);
  - when specifying parameters of the period of realizing the acquired SI:
    - control period of their realization (first field of the dialog);
    - maximum probability of incomplete realizing SI of each type for this period (second field);
  - a possible sign of selecting a SI type in DBSI for this task (sixth from the right field of the table);
  - number of initial SI (fifth from the right field of the table);
  - number of submitted requests for SI realization (forth from the right field of the table);
  - minimum number of being acquired SI (third from the right field of the table);
  - allowable number of being acquired SI (second from the right field of the table);
  - under restricting the period of realization of the acquired SI:
    - for mode of clearance sale with markdown of remaining SI — factor of markdown of such SI (first from the right field of the table).

**Note**

In the remaining fields of the table, located on the left and not available for input and editing

of information, is indicated information about the sources of income contained in the used DBSI.

6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the first group of parameters of all SI that you selected in the previous dialog.
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**. You can view in it the second group of parameters of all SI that you selected in the dialog ... (step 5).
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 8)**. You can view in it the third group of parameters of all SI that you selected in the dialog ... (step 5).
9. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 9)**, in which specify the following parameters:
  - type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);
  - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
10. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
  - at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task cipher>\_in.dat**);
  - select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

**Order of setting the remaining parameters of a task of type 4, which is possible in the following program localization modes:  
4.2.1 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
  - type of a DBSI that will connect (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your

task of type 4 (drop-down list);

- if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

### **Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- in the absence of a payback factor:
    - interest rate on the loan (first field of the dialog);
    - number of investment options (second field);
  - at payback factor for the consumed amount of investment in the absence of the initial SI:
    - interest rate on the loan (field).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3a)**, in which specify an addition to the selected early DBSI (drop-down list).
5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify the following parameters:
- in the absence of a payback factor:
    - for each investment option:
      - involved amount of the investor's own funds (second field of the table);
      - involved loan amount (third field of the table);

### **Note**

In the first field of the table, which is not available for input and editing of information, is indicated a serial number of investment option.

- at payback factor for the consumed amount of investment in the absence of the initial SI:
  - involved amount of the investor's own funds (first field of the dialog);
  - involved loan amount (second field);
  - payback period of investment (third field);
  - maximum value of a payback factor during PPI of the consumed amount of investment (forth field);
  - minimum value of this factor (fifth field);
  - number of its values (sixth field);
- at payback factor for the cost of initial SI in the absence of investment:
  - cost of all initial SI (first field of the dialog);

- maximum value of a payback period of investment (second field);
  - minimum value of PPI (third field);
  - number of its values (forth field);
  - factor of payback during PPI of the cost of all initial SI (fifth field).
6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5)**, in which specify the following parameters:
- under restricting the period of realization of the acquired SI:
    - allowable period of their realization(field of the dialog);
  - when specifying parameters of the period of realizing the acquired SI:
    - control period of their realization (first field);
    - maximum probability of incomplete realizing SI of each type for this period (second field);
  - a possible sign of selecting a SI type in DBSI for this task (fifth from the right field of the table);
  - number of initial SI (forth from the right field of the table);
  - minimum number of being acquired SI (third from the right field of the table);
  - allowable number of being acquired SI (second from the right field of the table);
  - under restricting the period of realization of the acquired SI:
    - factor of markdown of such SI (first from the right field of the table).

**Note**

In the remaining fields of the table, located on the left and not available for input and editing of information, is indicated information about the sources of income contained in the used DBSI.

7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the first group of parameters of all SI that you selected in the previous dialog.
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**. You can view in it the second group of parameters of all SI that you selected in the dialog ... (step 7).
9. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 8)**. You can view in it the third group of parameters of all SI that you selected in the dialog ... (step 7).
10. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 9)**, in which specify the following parameters:
- type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);

- duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
11. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
- at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task cipher>\_in.dat**);
  - select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

**Order of setting the remaining parameters of a task of type 5, which is possible in the following program localization modes:  
4.2.3 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
- type of a DBSI that will connect (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your task of type 5 (drop-down list);
  - if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

**Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- interest rate on the loan (field of the dialog).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify the following parameters:
- involved amount of the investor's own funds (first field of the dialog);
  - involved loan amount (second field);
  - parameter for the first restriction on the investment risk, which is the upper threshold for the factors of variation of SI parameters;

- number of values of this restriction (forth field);
- parameters for the second restriction on investment risk, which is the factor of reducing the allowable amount of acquired SI with the maximum factor of variation (for SI of other types the values of such factors will be reduced by the program in proportion to the reduction of factors of variation for these SI):
  - minimum value of this restriction (fifth field);
  - maximum value of it (sixth field);
  - number of values (seventh field).

**Note**

Factor of variation of a random parameter is the ratio of its mean square deviation to the mean value.

5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5<letter character>)**, in which successively set the following parameters in several tables:

**Note**

Each of these tables refers to a specific distribution of parameters of SI profitability, and the transition between these tables occurs using the button **Forth**.

- a possible sign of selecting a SI type in DBSI for this task (third from the right field of the table);
- minimum number of being acquired SI samples (second from the right field of the table);
- allowable number of being acquired SI samples (first from the right field of the table).

**Note**

In the remaining fields of the table, located on the left and not available for input and editing of information, is indicated information about the sources of income contained in the used DBSI.

6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the parameters of all the SI that were selected in the previous dialog. These parameters are formed in the following way from the contents of tables of the previous dialog: instead of parameters of the given distribution of a random value of SI profitability are specified mean values and factors of variation of this profitability.
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**, in which specify the following parameters:
  - type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);

- duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
- at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task cipher>\_in.dat**);
  - select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

**Order of setting the remaining parameters of a task of type 6, which is possible in the following program localization modes:  
1.1.2, 2.1.2, 4.1.2 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
- type of a DBSI that will connect (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your task of type 6 (drop-down list);
  - if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

**Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- interest rate on the loan (first field of the dialog);
  - number of investment options (second field).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify for each investment option the following parameters:
- involved amount of the investor's own funds (second field of the table);
  - involved loan amount (third field of the table).

### *Note*

In the first field of the table, which is not available for input and editing of information, is indicated a serial number of investment option.

5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5)**, in which specify the following parameters:
  - a possible sign of selecting a SI type in DBSI for this task (third from the right field of the table);
  - minimum number of being acquired SI samples (second from the right field of the table);
  - allowable number of being acquired SI samples (first from the right field of the table).

### *Note*

In the remaining fields of the table, located on the left and not available for input and editing of information, is indicated information about the sources of income contained in the used DBSI.

6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the parameters of all SI that you selected in the previous dialog.
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**, in which specify the following parameters:
  - type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);
  - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
  - at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task cipher>\_in.dat**);
  - select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

**Order of setting the remaining parameters of a task of type 7, which is possible in the following program localization modes:  
1.1.2, 2.1.2, 4.1.2 and 5 (see above instruction item 2)**

3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 3)**, in which specify the following parameters:
- type of a DBSI that will connect (three switches at the top);
  - cipher and name of a DBSI of specified type that will be used in solving your task of type 7 (drop-down list);
  - if you select a DBSI of limited type — possible mode of its automatic correction when solving this task (two switches at the bottom);

**Note**

The above mode of automatic correcting DBSI will operate only at *one* specified or calculated option of investment.

- at the changing specific income from SI exploitation on its initial sections:
    - interest rate on the loan (first field of the dialog);
    - number of investment options (second field);
  - at the random delay of the start of SI exploitation:
    - interest rate on the loan (field).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4)**, in which specify the following parameters:
- at the changing specific income from SI exploitation on its initial sections:
    - payback period of investment (first field of the dialog);
    - factor of payback during PPI of the consumed amount of investment (second field);
    - for each investment option:
      - involved amount of the investor's own funds (second field of the table);
      - involved loan amount (third field of the table);

**Note**

In the first field of the table, which is not available for input and editing of information, is indicated a serial number of investment option.

- at the random delay of the start of SI exploitation:
  - involved amount of the investor's own funds (first field of the dialog);
  - involved loan amount (second field);
  - payback period of investment (third field);

- maximum value of a payback factor during PPI of the consumed amount of investment (forth field);
  - minimum value of this factor (fifth field);
  - number of its values (sixth field).
5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5)**, in which specify the following parameters:
- a possible sign of selecting a SI type in DBSI for this task (third from the right field of the table);
  - minimum number of being acquired SI samples (second from the right field of the table);
  - allowable number of being acquired SI samples (first from the right field of the table).

*Note*

In the remaining fields of the table, located on the left and not available for input and editing of information, is indicated information about the sources of income contained in the used DBSI.

6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6)**. You can view in it the first group of parameters of all SI that you selected in the previous dialog.
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7)**. You can view in it the second group of parameters of all SI that you selected in the dialog ... (step 5).
8. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 8)**, in which specify the following parameters:
- type of rounding the cost parameters: on minimum (left switch), on middle (average) or on maximum (right);
  - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
  - protective scaling factor for the SI cost and proceeds from realization, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
9. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
- at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**io\_<six-digit task cipher>.dat**) and its input file (**io\_<task ci-**

**pher>\_in.dat**);

- select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** and **Solving of tasks**⇒**Execution of optimization**.

## Creating a new task with repetitive parameters

If the new task will have the same SI parameters as some existing task, then do the following:

1. Choose the command **Input** ⇒ **Input of a new task by data import**, opening the dialog **Input of the task data (step 1)**, where do the following:
  - enter a six-digit cipher of the new task, which may include Latin characters and digits (first field of the dialog);
  - enter a name of this task (second field);
  - select format of a being imported file which contains input data of another task: own format of the program (left switch **DAT**) or standard format Excel (right switch **XLS**);

### *Note*

Mode of import into a new task of input data of another task, been stored in Excel-file, was introduced due to the fact that the program has a mode of export input data of existing tasks into files of Excel type (command **Export of the task data to Excel-table** of menu **Tasks output**).

- when selecting **DAT** do the following:
    - select in the first drop-down list the existing task, input data of which should be copied to the current task;
    - click the button **Import**;
  - when selecting **XLS** do the following:
    - click the button **Import the Excel-file**;
    - in the opened dialog **Open** select on the disk required file (with extension "xls"), and click the button of the same name.
2. Moving with the button **Forth** from the current dialog to a next one, look through in all dialogs the input data of a current task and make necessary changes in them (*see above sect. "Creating a new task with unique parameters"*).
  3. Click the button **Ready** in the last dialog. At that, in the folder **Data** will be created two files of the task: general and input.

## Correction of task input data

This operation can be performed in two ways:

- ❑ during the operation to create a new task (see above);
- ❑ by using the command **Input⇒Correction of input data of unsolved task**, that is available for use to such unsolved tasks, which input files have not been copied to the folder **Solving** for their solution (selection of a task to correct its input is made in the dialog **List of tasks**, which opens on the screen when executing this command).

## Uploading a file with input data of a new task

After creating a new task, you need to copy its input file (with input data of the task) to the folder **Solving** for its subsequent solution (see below). This operation is executed in the following order:

### *Note*

After completing the operation in question concerning to some unsolved task you can not correct its input data.

1. Choose the command **Control⇒Work with a task protocol**, opening the dialog **Protocol of tasks**.
2. Select in the dialog upper list the required task, for which the operation in question was not fulfilled (this is indicated by the record "A stage of data input" in line "State of a task" of the protocol table).
3. Click the button **Upload the file of task input data**, which in this case becomes unlocked. At that happens the following:
  - in the folder **Solving** appears a duplicate of the input file of current task;
  - in line "State of a task" of the protocol table appears record "Waiting for solution";
  - the button **Upload the file of task input data** becomes locked.

## Solving tasks

Operation of solving tasks, which input files are placed in the folder **Solving**, is performed in the following order:

1. Choose the command **Solving of tasks⇒Execution of optimization**, opening the dialog **Optimization module of MLIS IO 2.2**.
2. Set the required mode of processing: *batch* (for solving all group of tasks) or *individual* (for solving only one task), and then click the button **Next**.
3. When working in batch mode, do the following:
  - if necessary, adjust specified parameters of optimization, and then click the button **Next**;

- click the button **START** at the bottom, resulting in a process of successive solving the tasks of this group, when a name of this button changes to **WORK**;
  - after this button again be called **START**, which indicates the completion of solving the entire group of tasks, close the dialog **Optimization module of MLIS IO 2.2** by clicking the button **EXIT** (bottom right).
4. When working in individual mode, do the following:
- type in the dialog field a six-digit cipher code of a solvable task and click the button **Next**;
  - if necessary, adjust the parameters of optimization scheme, and then click the button **Next**;
  - click the button **START** at the bottom, resulting in a process of solving selected task, when a name of this button changes to **WORK**;
  - after this button again be called **START**, which indicates the completion of solving the current task, close the dialog **Optimization module of MLIS IO 2.2** (button **EXIT**).

## Connecting a file with task solving results

After performing the operation of solving the tasks you should transfer files with the result of their solution (**io\_<task cipher>\_out.dat**) from the folder **Solving** to the folder **Data**. This operation performs in the following order:

### *Note*

After performing this operation concerning some solved task it is impossible its repeated processing. That may be required, in particular, in case of absence of its successful solution due to wrong choice of values of the optimization schemes parameters.

1. Choose the command **Control⇒Work with a task protocol**, opening the dialog **Protocol of tasks**.
2. Select in the upper dialog list the required task, which input file was copied to the folder **Solving** (this is indicated by the record "Waiting for solution" in line "State of a task" of the protocol table).
3. Click the button **Load the file of task solving results**, which in this case becomes unlocked. At that happens the following:
  - input file of the current task is removed from the folder **Solving**, and its output file is moved from this folder to the folder **Data**;
  - in line "State of a task" of the protocol table appears record "A task is solved";
  - the button **Load the file of task solving results** becomes locked.

## Working with a tasks protocol

A protocol of tasks contains general information about existing tasks of network purchases optimization, being solved by LVP MLIS IO 2.2 (these data are stored in the file **protocol.ptl** placed in the folder **System**). On the screen displays in tabular form such part of the protocol, which refers to a user-selected task. It contains the following formation:

- cipher and name of this task;
- current state of the task, which can be one of three: " A stage of data input", "Waiting for solution" or "A task is solved";
- dates and times of occurrence for the four different event.

Transition to the mode of work with a tasks protocol is performed by the command **Control⇒Work with a task protocol**, which opens the dialog **Protocol of tasks**. In this window, the following operations can be performed:

- viewing general information about the existing tasks;
- upload the input file a new task, that contains its input data (see above);
- connecting the output file of the task containing the results of its solution (see above);
- removal of those tasks that are no longer necessary for the user (button **Delete the task**).

## Creating the statistics of the solved task

The operation of creating a statistical report (statistics) for a some solved task of investment optimization, which contains either the SI with random spread of profitability parameters or the restriction a period of realizing acquired SI is performed in the following order:

### *Note*

The main purpose of statistical report is to provide the user with all the necessary data on the basis of which he can either choose the best investment strategy, taking into account the risk factor of investment among all the strategies found as a result of solving the task (if there are SI with random spread of profitability parameters), or objectively evaluate the found strategies taking into account the risk factor. These data include the threshold income from the investment with different probabilities of its risk, as well as the average values of this income for all the investment options stipulated in the task.

1. Choose the command **Statistics⇒Creation of the solved task statistics**, opening the dialog **Module of statistics creation of MLIS IO 2.2**.
2. Set the following parameters in this dialog:
  - a cipher of that solved task for which will be created the statistics (first field of the dialog);
  - number of cycles of statistical modeling (second field);
  - one of two possible options of changing the profitability random parameters (if

any) for the same-type samples of SI;

- option of sameness of these parameters in connection with their full dependence (left switch);
  - option of their non-sameness in connection with independence (right);
3. Click at the dialog bottom the button **START**, as a result of which will start the process of statistical modeling, while the name of this button will change to **WORK**. As soon as this process is completed, this button will again be called **START**, and an information panel will appear on the screen with a message about the successful creation of statistics.
  4. Close this panel by clicking on the button **OK**, and then either close the dialog **Module of statistics creation of LVP MLIS IO 2.2** by clicking on the button **EXIT**, or go to step 2 of this instruction to continue working in the mode of creating statistical reports.

## Output of task input data

Input data for any existing task of network purchases optimization may be brought out to the screen, Excel-file and print. This operation is performed in the following order:

1. Choose the command **Tasks output⇒Viewing input data of any task**.
2. In the opened dialog **List of all tasks** select the desired task and click the button **OK**. At that, the current dialog is closed and opens the window **Viewing input data of the task "<task name>"** with tabular input data of the task chosen by you, which can be looked through.
3. To bring out these data to a new Excel document, choose the command **Export of the task data to Excel-table** of menu **Tasks output**, to print them — the command **Printing the task data** of the same menu.

## Output of task solving results

Output data for any solved task of network purchases optimization may be brought out to the screen, Excel-file and print. This operation is performed in the following order:

1. Choose the command **Tasks output⇒Viewing output data of the solved task**.
2. In the opened dialog **List of solved tasks** select the required task and click the button **OK**, closing this dialog. At that, on the screen appears the control panel **Choice of investment options for output of information**, that contains checkboxes with numbers of investment options calculated for the task.
3. Set on this panel checkboxes for which you want to bring out the results of calculating, and then close the panel by clicking on the button **OK**. At that, opens the window **Viewing solution result of the task "<task name>"** with tabular output data of the task for chosen by you investment options.
4. To bring out these data to a new Excel document, choose the command **Export of the task data to Excel-table** of menu **Tasks output**, to print them — the command **Print-**

ing the task data of the same menu.

## Output of statistics of the solved task

A statistical report, which has been created for some solved task containing SI with random spread of parameters, can be output on screen, to Excel file and to print. This operation is performed in the following order:

1. Choose the command **Statistics⇒Viewing statistics of the solved task**.
2. In the opened dialog **List of solved tasks with statistics** select the required task and click the button **OK**, closing this dialog. At that, opens the dialpog **Selecting parameters of statistics output**, in which specify the following parameters:
  - values of probabilities of investment risk for the output of threshold income values in the found investment options (upper flags);
  - in the case of presence SI with random spread of profitability parameters:
    - criterion for automatic search of the best investment option (one of the three left switches) or the absence of such criterion (right switch);
    - parameters of the selected search criterion (field and five switches at the dialog bottom).
3. Close the dialog by clicking on the button **OK**. At that opens the dialog **Viewing the statistical report for the solved task "<task name>"** with the requires statistical report.
4. To output this report into a new Excel document, execute the command **Export of the statistics to Excel-table** of menu **Statistics**, to print out it — the command **Printing the statistics** of the same menu.

## Operations with database of sources of income

### Creation of a new DBSI with unique parameters

If the content of the new database of sources of income is significantly different from the same content of any existing DBSI, then follow these steps:

1. Choose the command **Work with databases of sources of income⇒Creation of a new DBSI**, opening the dialog **Creation of database of sources of income (step 1)**, where do the following:
  - select a type of tasks to be solved (first group of 7 switches);

#### *Note*

Depending on the current localization mode of the program, some of these switches may be blocked in order to prevent the creation of DBSI for those types of tasks that are incompatible with this mode.

- select a type of the being created DBSI (second group of 2 switches);
- when choosing tasks of any type, except for the 4-th:
  - enter a *three-digit* numeric code of the being created DBSI (first field of the dialog);
  - enter a name of this DBSI (second field);
- when choosing tasks of the 4-th type:
  - select a mode of creating DBSI (third group of 3 switches);
  - for the mode of creating the entire DBSI:
    - enter a code of the being created DBSI (first field);
    - enter a name of this DBSI (second field);
    - enter a *two-digit* code of the being created addition to this DBSI (third field);
    - enter a name of this addition (forth field);
  - for the mode of creating only the main part of DBSI:
    - enter a code of the being DBSI (first field);
    - enter a name of this DBSI (second field);
  - for the mode of creating only the addition to DBSI:
    - enter a code of the connectable DBSI (first field);
    - enter a code of the being addition to this DBSI (second field);
    - enter a name of this addition (third field).

**Note**

The further order of setting DBSI parameters depends on the type of tasks that can be solved with its help. Here are seven possible options for the next steps on setting parameters, each of which corresponds to a specific type of tasks.

**Order of setting the remaining parameters of DBSI  
for tasks of type 1 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of 3)**, wherein specify the following parameters:
  - units of measurement for cost of SI samples (drop-down list);
  - initial numbers of SI types (first field of the dialog);
  - minimum threshold of the ratio between the proceeds from realizing one SI and its cost (second field).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 3)**, wherein you specify the parameters of income sources, which include:

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);
- expected proceeds from realizing one SI (fourth field of the table);
- in the fifth field of the table:
  - for a DBSI of unlimited type: possible sign of temporary absence of SI;
  - for a DBSI of limited type: number of SI samples in the database;
- possible sign of deleting SI type (sixth field of the table).

**Note**

In the first field of the table, which is not accessible for input and editing of information, is indicated the SI type, which coincides with its serial number in the database.

4. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate the DBSI file in the folder **Dbsi** with the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**.

**Order of setting the remaining parameters of DBSI  
for tasks of type 2 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of 5)**, wherein specify the following parameters:
  - units of measurement for cost of SI samples and for time (two drop-down lists).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 5)**, wherein specify the initial numbers of SI with different distributions of their profitability parameters, divided into 5 categories (five fields of the dialog).
4. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4a of 5)**, wherein specify parameters for the SI category "distribution is absent", which include:

**Note**

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);

- specific income from possessing one SI (forth field of the table);
  - expected proceeds from realizing one SI (fifth field of the table);
  - in the sixth field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (seventh field of the table).
5. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4b of 5)**, wherein specify parameters for the SI category "normal distribution", which include:

*Note*

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - specific income from possessing one SI (forth field of the table);
  - probabilistic parameters of the expected proceeds from realizing one SI:
    - average value (fifth field of the table);
    - mean square deviation (sixth field of the table);
  - in the seventh field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (eighth field of the table).
6. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4c of 5)**, wherein specify parameters for the SI category "exponential distribution", which include:

*Note*

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);
- specific income from possessing one SI (forth field of the table);

- probabilistic parameters of the expected proceeds from realizing one SI:
    - minimum value (fifth field of the table);
    - average value (sixth field of the table);
  - in the seventh field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (eighth field of the table).
7. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4d of 5)**, wherein specify parameters for the SI category "uniform distribution", which include:

*Note*

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - specific income from possessing one SI (fourth field of the table);
  - probabilistic parameters of the expected proceeds from realizing one SI:
    - minimum value (fifth field of the table);
    - maximum value (sixth field of the table);
  - in the seventh field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (eighth field of the table).
8. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4e of 5)**, wherein specify parameters for the SI category "jump-like distribution", which include:

*Note*

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);

- specific income from possessing one SI (forth field of the table);
  - probabilistic parameters of the expected proceeds from realizing one SI:
    - four values (fields 5, 7, 9 and 11 of the table);
    - probabilities of realizing these values (fields 6, 8, 10 and 12 of the table);
  - in the field 13 of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (field 14 of the table).
9. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 5 of 5)**. You can view in it the parameters of the all previously specified SI. These parameters are formed as follows from the tables contents of the previous dialogs: instead of the parameters of the given distribution of a random value of SI profitability are indicated the mean values and the factors of variation of this profitability.
10. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate the DBSI file in the folder **Dbsi** with the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**.

**Order of setting the remaining parameters of DBSI  
for tasks of type 3 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of 5)**, wherein specify the following parameters:
- units of measurement for cost of SI samples and for time (two drop-down lists).
  - initial number of SI types (field of the dialog).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 5)**, wherein specify the parameters of sources of income, which include:
- description of a same-type sample of SI (second field of the table);
  - number of options for SI purchase value (third field of the table);
  - number of options for SI realization proceeds (forth field of the table);
  - in the fifth field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;

- possible sign of deleting SI type (sixth field of the table).

**Note**

In the first field of the table, which is not available for input and editing of information, is indicated SI type, which coincides with its serial number in the database.

4. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 4 of 5)**, wherein set the parameters of SI purchase, which include:
  - minimum number of SI in a batch (third from the right field of the table);
  - maximum number of SI in a batch (second from the right field of the table);
  - purchase value of one SI (first from the right field of the table).
5. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 5 of 5)**, wherein specify the parameters of realizing SI, which include:
  - expected proceeds from realizing one SI (second from the right field of the table);
  - expected intensity of entering requests on SI realization (first from the right field of the table).
6. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate the DBSI file in the folder **Dbsi** with the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**.

**Order of setting the remaining parameters of DBSI  
for tasks of type 4 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of 5)**, wherein specify the following parameters:
  - units of measurement for cost of SI samples and for time (two drop-down lists).
  - initial number of SI types (field of the dialog).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 5)**, wherein specify the first group of SI parameters in the main part of DBSI, which include:
  - description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - specific income from possessing one SI (forth field of the table);
  - number of options from realizing SI (fifth field of the table);

- in the sixth field of the table:
  - for a DBSI of unlimited type: possible sign of temporary absence of SI;
  - for a DBSI of limited type: number of SI samples in the database;
- possible sign of deleting SI type (seventh field of the table).

### *Note*

In the first field of the table, which is not accessible for input and editing of information, is indicated the SI type, which coincides with its serial number in the database.

4. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 4 of 5)**, wherein set the second group of SI parameters in the main part of DBSI, which include:
  - expected profits from realizing one SI (first from the right field of the table).
5. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 4a of 5)**, wherein specify the first group of SI parameters in the additional part of DBSI, which include:
  - number of points of the tabular function of distributing a random time before the entry of a request on SI realization (first from the right field of the table).
6. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 5 of 5)**, wherein set the second group of SI parameters in the additional part of DBSI, which include:
  - for every point of the tabular function:
    - value of argument: random time to the entry of a request on SI realization (second from the right field of the table).
    - value of function of distributing this time (first from the right field of the table).
7. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate in the folder **Dbsi** the main file of DBSI with the name **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**, and the file of addition with the name **<type of tasks to be solved><database type>\_<database numeric code>\_<code of an addition (2 digits) #\_<three-digit code of language of the current program shell>.dat**.

### **Order of setting the remaining parameters of DBSI for tasks of type 5 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of 5)**, wherein specify the following parameters:

- units of measurement for cost of SI samples and for time (two drop-down lists).
  - minimum threshold of the ratio between specific income from exploitation of one SI and its cost (field of the dialog).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 5)**, wherein set the initial numbers of SI with different distributions of their profitability parameters, divided into 5 categories (five fields of the dialog).
  4. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4a of 5)**, wherein specify parameters for the SI category "distribution is absent", which include:

*Note*

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - expected specific value from exploitation of one SI (fifth field of the table);
  - in the sixth field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (seventh field of the table).
5. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4b of 5)**, wherein specify parameters for the SI category "normal distribution", which include:

*Note*

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);
- probabilistic parameters of the expected specific income from exploitation of one SI:
  - average value (fifth field of the table);
  - mean square deviation (sixth field of the table);
- in the seventh field of the table:

- for a DBSI of unlimited type: possible sign of temporary absence of SI;
  - for a DBSI of limited type: number of SI samples in the database;
6. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4c of 5)**, wherein specify parameters for the SI category "exponential distribution", which include:

**Note**

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - probabilistic parameters of the expected specific income from exploitation of one SI:
    - minimum value (fifth field of the table);
    - average value (sixth field of the table);
  - in the seventh field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (eighth field of the table).
7. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4d of 5)**, wherein specify parameters for the SI category "uniform distribution", which include:

**Note**

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);
- probabilistic parameters of the expected specific income from exploitation of one SI:
  - minimum value (fifth field of the table);
  - maximum value (sixth field of the table);
- in the seventh field of the table:

- for a DBSI of unlimited type: possible sign of temporary absence of SI;
  - for a DBSI of limited type: number of SI samples in the database;
8. Click in the current dialog the button **Forth**. At that will occur a transition to the dialog **Creation of database of sources of income (step 4e of 5)**, wherein specify parameters for the SI category "jump-like distribution", which include:

**Note**

The transition to this dialog will occur provided that the positive number of SI of this category, specified earlier. In the case of zero number of them, will occur a transition to the dialog with parameters of SI of that next in order category (see below), wherein number of SI is positive.

- description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - probabilistic parameters of the expected specific income from exploitation of one SI:
    - four values (fields 5, 7, 9 and 11 of the table);
    - probabilities of realizing these values (fields 6, 8, 10 and 12 of the table);
  - in the field 13 of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (field 14 of the table).
9. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 5 of 5)**. You can view in it the parameters of the all previously specified SI. These parameters are formed as follows from the tables contents of the previous dialogs: instead of the parameters of the given distribution of a random value of SI profitability are indicated the mean values and the factors of variation of this profitability.
  10. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate the DBSI file in the folder **Dbsi** with the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**.

**Order of setting the remaining parameters of DBSI  
for tasks of type 6 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database**

**of sources of income (step 2 of 3)**, wherein specify the following parameters:

- units of measurement for cost of SI samples and for time (two drop-down lists).
  - initial number of SI types (first field of the dialog);
  - minimum threshold of the ratio between specific income from exploitation of one SI and its cost (second field).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 3)**, wherein you specify the parameters of income sources, which include:
- description of a same-type sample of SI (second field of the table);
  - cost of one SI (third field of the table);
  - expected specific value from exploitation of one SI (forth field of the table);
  - in the fifth field of the table:
    - for a DBSI of unlimited type: possible sign of temporary absence of SI;
    - for a DBSI of limited type: number of SI samples in the database;
  - possible sign of deleting SI type (sixth field of the table).

#### *Note*

In the first field of the table, which is not accessible for input and editing of information, is indicated the SI type, which coincides with its serial number in the database.

4. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate the DBSI file in the folder **Dbsi** with the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**.

#### **Order of setting the remaining parameters of DBSI for tasks of type 7 being solved (see above instruction item 1)**

2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of 4)**, wherein specify the following parameters:
- units of measurement for cost of SI samples and for time (two drop-down lists).
  - initial number of SI types (first field of the dialog);
  - minimum threshold of the ratio between specific income from exploitation of one SI and its cost (second field).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 3 of 4)**, wherein you specify the parameters of income sources, which include:

- description of a same-type sample of SI (second field of the table);
- cost of one SI (third field of the table);
- expected specific value from exploitation of one SI in stationary mode (forth field of the table);
- number of points of the tabular function (fifth field of the table);
- in the sixth field of the table:
  - for a DBSI of unlimited type: possible sign of temporary absence of SI;
  - for a DBSI of limited type: number of SI samples in the database;
- possible sign of deleting SI type (seventh field of the table).

### **Note**

In the first field of the table, which is not accessible for input and editing of information, is indicated the SI type, which coincides with its serial number in the database.

4. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 4 of 4)**, wherein set the tabular functions of distribution for the specified SI parameters:
  - for every point of the tabular function:
    - value of argument: a current duration of SI exploitation or possession of it (second from the right field of the table);
    - value of tabular function (first from the right field of the table).
5. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income**. Look through in it the main input data of the DBSI and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSI input data. Otherwise click the button **Ready**, as a result of it the program will generate the DBSI file in the folder **Dbsi** with the following name: **<type of tasks to be solved (1 digit)><database type (1 digit)>\_<database numeric code (3 digits)>\_dbsi\_<three-digit code of language of the current program shell>.dat**.

## **Creation of a new DBSI with repetitive parameters**

If the new database of sources of income will be based on one of the existing DBSI, then do the following:

1. Choose the command Work with databases of sources of income⇒**Creation of a new DBSI by data import**, opening the dialog **Creation of database of sources of income (step 1)**, wherein follow the same steps as in the item 1 of the previous instruction (*see above sect. "Creation of a new DBSI with unique parameters "*).
2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of database of sources of income (step 2 of ...)**, where do the following:

- select format of a being imported file of DBSI: own format of the program (left switch **DAT**) or standard format Excel (right switch **XLS**);

### *Note*

Mode of import into a new DBSI of the contents of another DBSI, been stored in Excel-file, was introduced due to the fact that the program has the mode of exporting information from the existing DBSI to Excel files (command **Export DBSI into Excel-table** of menu **Work with databases of sources of income**).

- when selecting **DAT** do the following:
  - select in the drop-down list such existent DBSI, the contents of which should be copied to the current database;
  - click the button **Import**;
- when selecting **XLS** do the following:
  - click the button **Import the Excel-file**;
  - in the opened dialog **Open** select on the disk required file (with extension "xls"), and click the button of the same name.

### *Note*

In case of creating a DBSI for tasks of the 4-th type, when you click the button **Forth** occurs a transition to the dialog **Creation of database of sources of income (step 2a of 5)**, in which, in the same way as in the current dialog, a choice is made for a being imported file of the addition to this DBSI.

3. Moving with the button **Forth** from the current dialog to a next one, look through in all dialogs the input data of a current DBSI and make necessary changes in them (*see above sect. "Creation of a new DBSI with unique parameters"*).
4. Click the button **Ready** in the last dialog. At that, in the folder **Dbscs** will be created a file of the new DBSI of specified type.

## Correction of DBSI contents

This operation can be performed in two ways:

- during the operation to create a new DBSI (see above);
- by using the command **Work with databases of sources of income**⇒**Correction DBSI** (selection of a DBSI for its correction is made in the dialog **List of databases of sources of income**, which opens on the screen when executing this command).

## Output of DBSI contents

Contents of any existing DBSI may be brought out to the screen and and Excel-file. In the first case is used the connamd **Viewing DBSI** of meny **Work with databases of sources of income**, and in the second — the command **Export DBSI into Excel-table** of

the same menu.

## **Deletion of DBSI**

Deleting any DBSI can be performed using the command **Deletion DBSI** of menu **Work with databases of sources of income**.