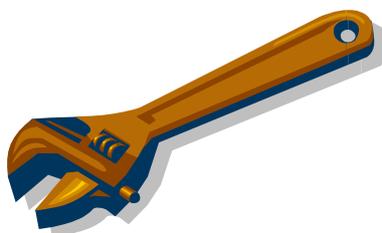


RELAIS

Installation Guide in Windows Environment

Version 3.1



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1 RELAIS: installation and configuration

In this manual, we present the installation procedure to use the toolkit RELAIS version 3.1 in Windows environments.

To run RELAIS needs the following software environments:

- Java JDK 13 or higher;
- MySql Server 5 or higher and MySQL ODBC driver;
- R 3.4, or higher, with packages ROI.plugin.clp and RODBC.

To install Java and MySql environments, you must be administrator of your PC.

1.1 Java Environment

1.1.1 Installing Java JDK

As first step, ensure that **Java SE Development Kit (JDK)** release 13 or higher are installed on your pc. If not you need to download from the web the last release of JDK and install them.

No special configuration are required.

1.1.2 Setting the PATH variable with JDK bin directory

As second step, modify the system variable PATH by adding the bin directory of JRE, by default this appears as sub directory of 'Program Files', for example:

C:\Program Files\Java\jdk-13.0.1\bin

To modify the system variable PATH, you must choose the 'System' item from the Control Panel menu; you can also click with the right button on the desktop icon 'My computer' and select 'Properties' from the pop-up menu. Then, select the "Advanced" panel, a window as shown in Figure 1 will be displayed.

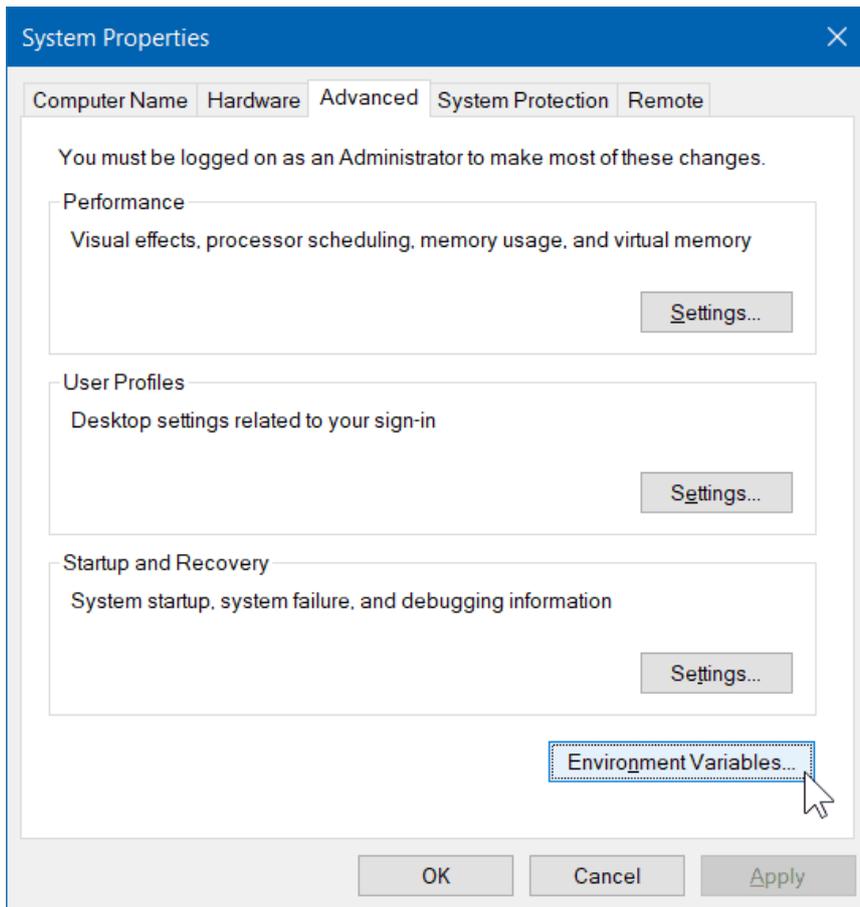


Figure 1. Advanced System Settings window

Clicking on the “Environment Variables...” button appear the window shown in Figure 2.

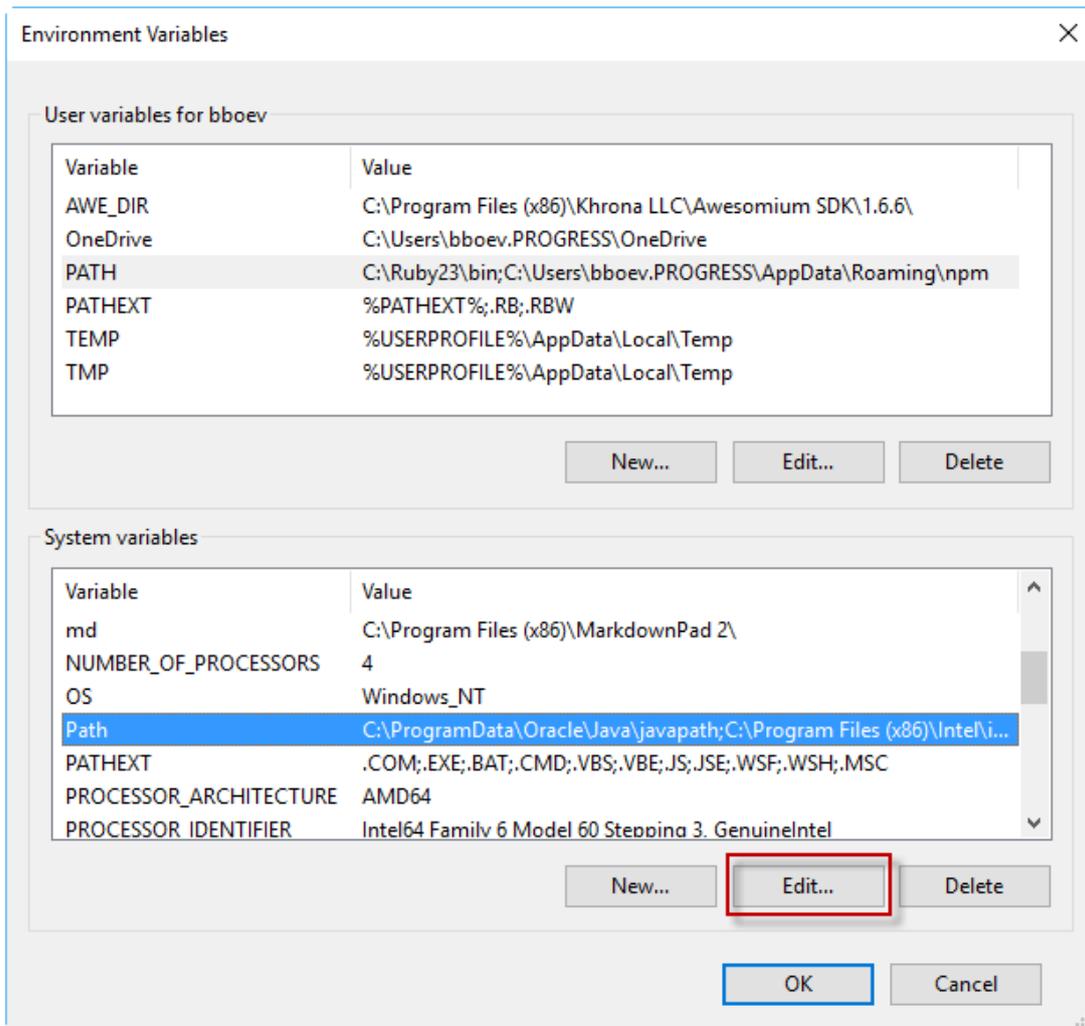


Figure 2. Environment Variables window

Now select the variable 'PATH' in the 'System variables' section, and click 'Edit' button, this opens a new window dialog shown in Figure 3.

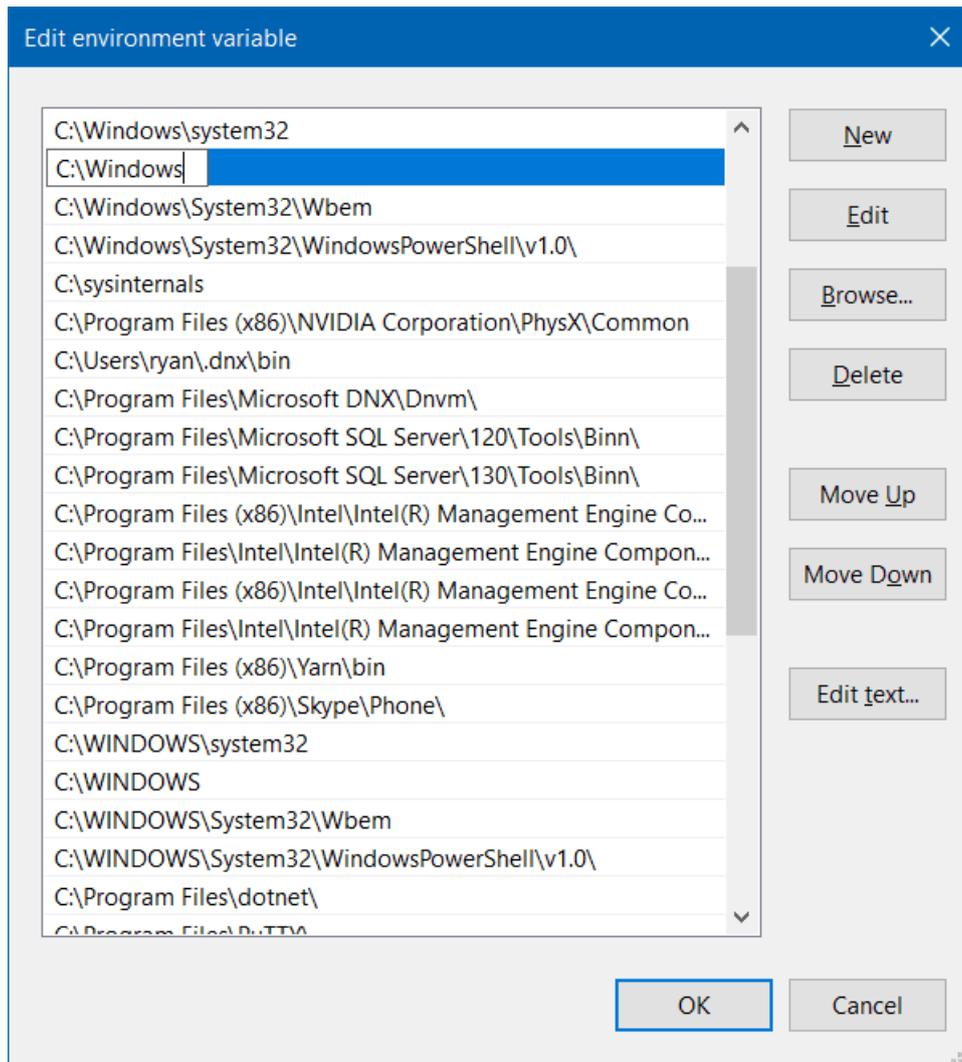


Figure 3. System Variables Window Dialog

Add the JDK bin directory using the ‘New’ button and finally move the line, using the ‘Move up’ button, so as to be superior to any other references concerning java.

1.2 R Environment

1.2.1 Installing R

As first step, ensure that **R** release 3.4.0 (or higher) is installed in your pc. If R is not available or an holder version is installed, you have to download the last setup release of R from the web (www.r-project.org).

No configuration choices, different from those proposed by default, are required during the installation.

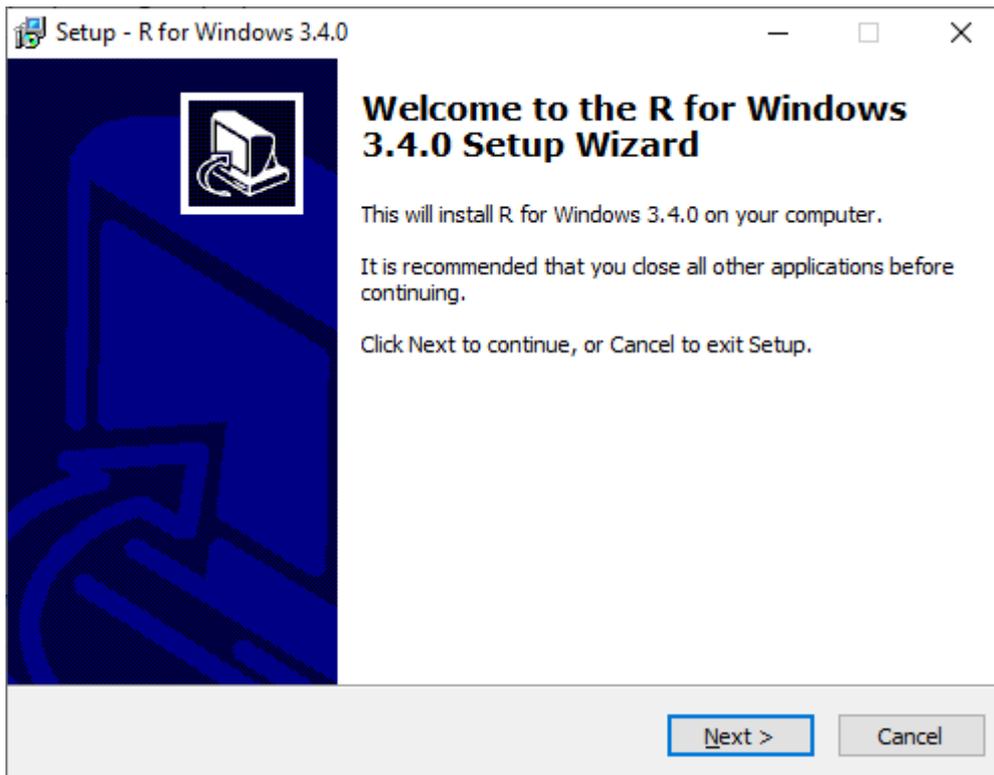


Figure 4 – R for windows setup

1.2.2 Setting the PATH variable with R bin directory

Modify the system variable PATH by adding the bin directory of R, by default this is a sub directory of 'Program Files', for example:

`C:\Program Files\R\R-3.4.0\bin`

This information is also available clicking with the right button on the desktop shortcut icon of R ('Target' value).

To modify the system variable PATH you can proceed as described in paragraph 1.1.2, adding the R bin directory move up the line so as to be superior to any references concerning other versions of R.

1.2.3 Installing required R packages

To run properly, RELAIS requires the installation of the following R packages:

- RODBC
- ROI.plugin.clp (consequently also 'ROI' and 'slam' packages will be installed)

To install the R packages you must run the R program (Rgui.exe). In the R GUI (see Figure 5) choose the 'Packages' menu and click on the 'Install package(s)' item.

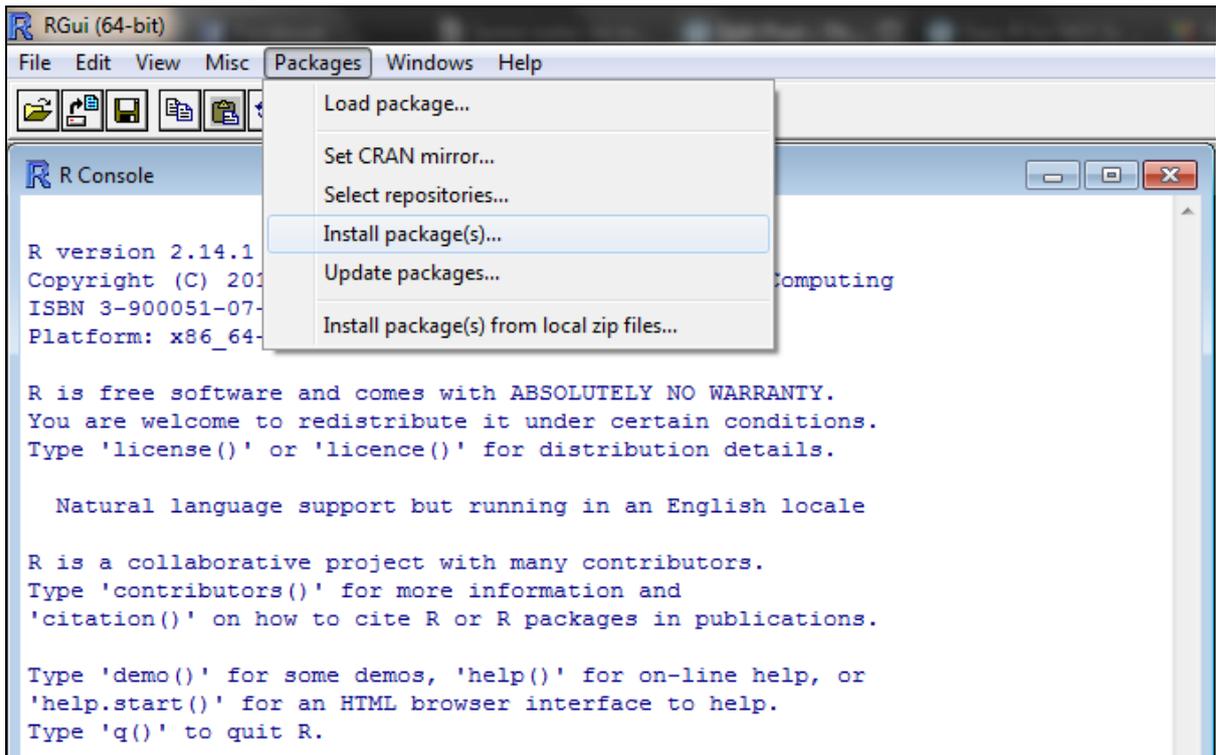


Figure 5. Install packages from R GUI

Choose to which CRAN mirror connect from those proposed in the window dialog (see Figure 6 on the left). After connected to the CRAN, you must chose the packages (RODBC and others required) from the proposed list (see Figure 6 on the right).

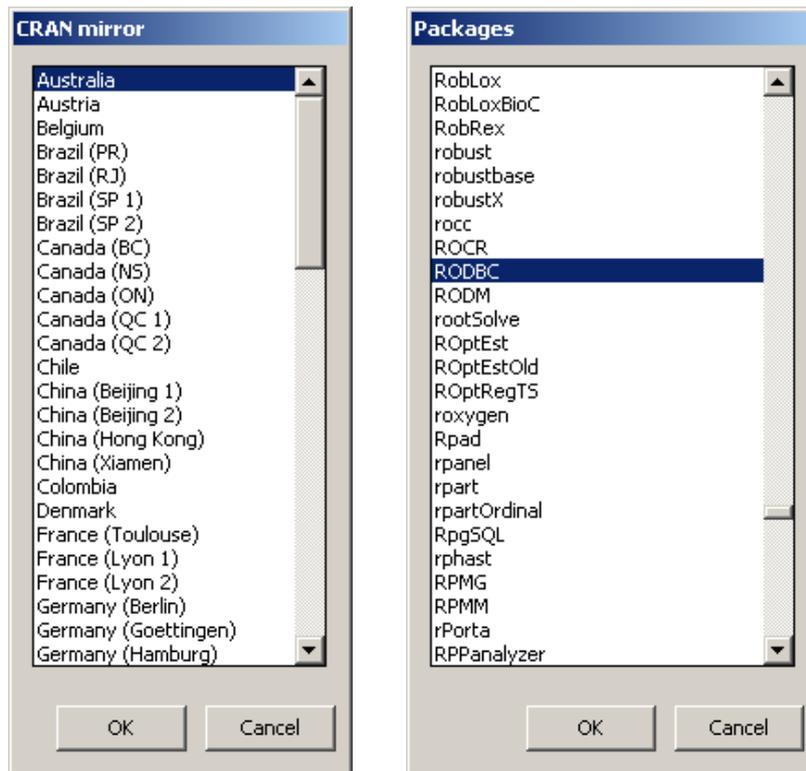


Figure 6. CRAN mirror and R packages lists

Please ensure that **the version of R referenced in the PATH variable is the same used to install the packages.**

1.3 MySQL Environment

Since version 2.0, RELAIS use the MySQL database to save datasets, parameters and temporary results.

Initially our software used the anonymous account to connect to MySQL. This simplified the configuration step.

However, in the version 5.4 of MySQL the anonymous user has been disabled, and this choice still remains valid until the current version (8.0).

If the anonymous user is not available in the version you are installing, it is necessary to create a MySQL account for RELAIS. If you do not need particular attention on database security, our advice is to use the root account (the administrator) also as account for RELAIS.

In the case you use the anonymous account following the steps described in the paragraphs 1.3.2 and 1.4.2 are needed and paragraph 1.3.3 can be skipped. Instead, in the case you do not use the anonymous account following the paragraph 1.3.3 is needed and paragraph 1.4.2 can be skipped.

1.3.1 Installing MySQL Server

As first step, ensure that MySQL Server release 5.0 (or higher) is already running in your pc.

If not, you have to download the MySQL Server setup file from the web. In the recent versions, the use of MySQL Installer is mandatory.

The manual to use MySQL Installer is available on the web at URL:

<https://dev.mysql.com/doc/refman/8.0/en/mysql-installer.html>

No configuration choices, different from those proposed by default, are required during the installation of the Server. The instance (see Figure 7) must be configured at once.



Figure 7. To configure now the instance in MySQL 5.0

RELAIS does not require particular settings in the instance configuration. However, remember to keep note of the **root password** entered during configuration (see Figure 8).

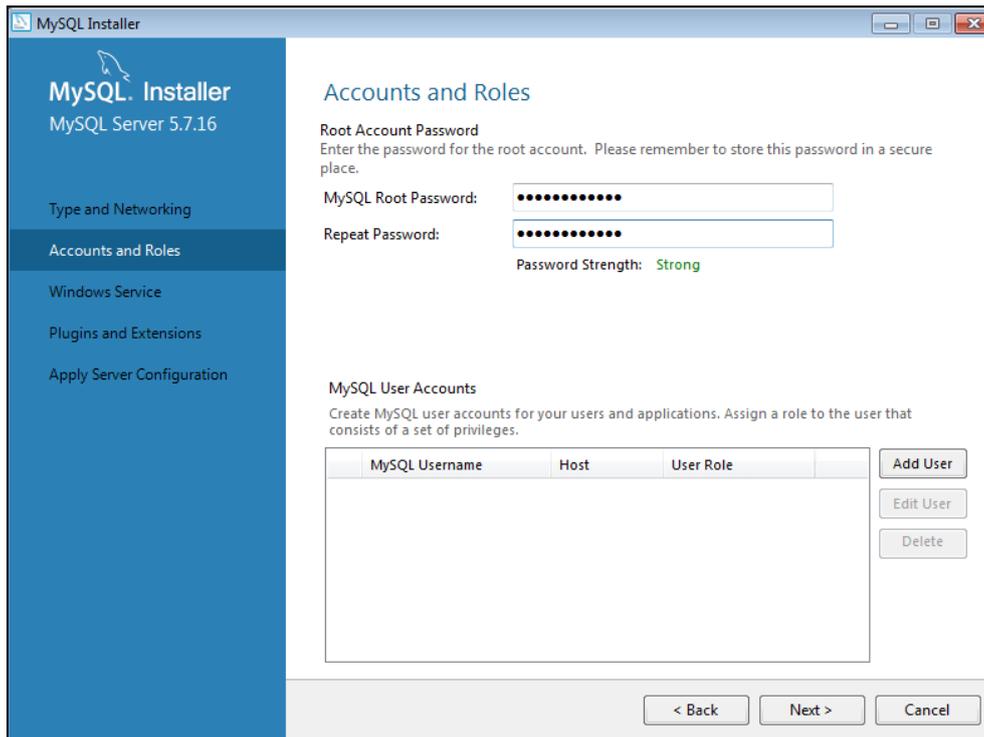


Figure 8. Setting of the root password in MySQL 5.7

Moreover, if you use MySQL Server release 5.0 or 5.1, the enable of anonymous account is strongly recommended. This procedure is detailed in the next paragraph (1.3.2).

1.3.2 Configuring MySQL Server to enable the anonymous account

This step is not mandatory and can be performed only in MySQL Server Release 5.0 or 5.1.

If a MySQL instance is already running with the anonymous account is disabled, you have to remove it and create a new instance with anonymous account otherwise RELAIS can not access to the data.

To remove an existing instance of MySQL Server, use 'MySQL Server Instance Configuration Wizard' function available in MySQL group of Start menu.

In the maintenance option window choose 'Remove Instance' as displayed in Figure 9.

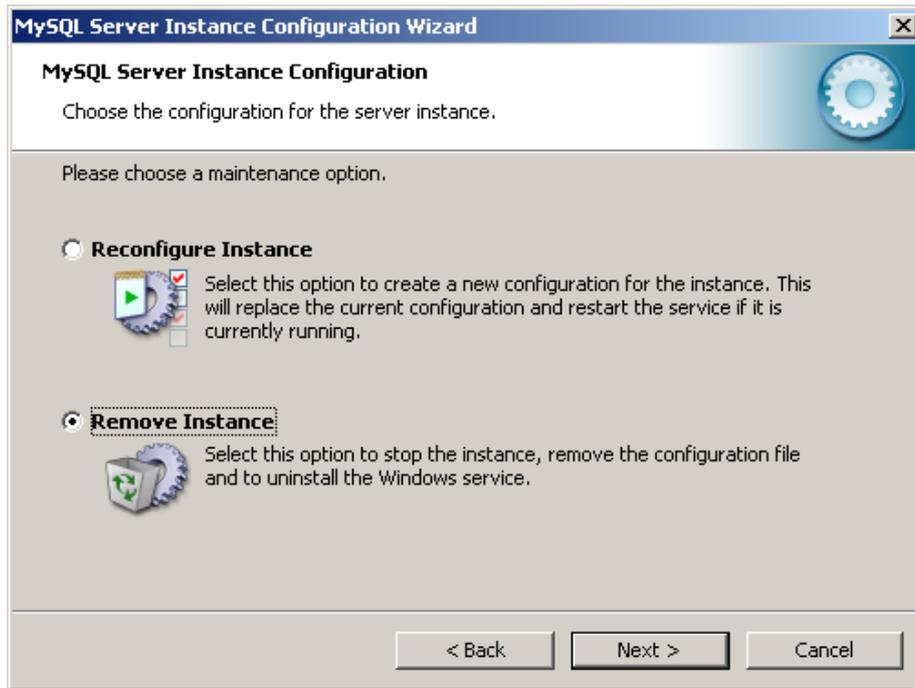


Figure 9. Maintenance Option window

To create a new instance use 'MySQL Server Instance Configuration Wizard' function available in MySQL group of Start menu.

RELAIS does not need special settings of the instance configuration but is very important create the anonymous account in the security setting configuration (see Figure 10) scoring out the 'Create an Anonymous Account' check button.



Figure 10. Setting Configuration Window

Finally, you can finish the configuration. The wizard will automatically start the MySQL instance.



Figure 11 – MySQL instance started successfully

If an error occurs in this phase, it is recommended to remove the instance and start the configuration from the beginning.

1.3.3 Create a MySQL User for RELAIS

RELAIS needs a MySQL user account to connect to the database. If the local instance has enabled the anonymous account (you have successfully completed the procedure in paragraph 1.3.2) then RELAIS will use this by default.

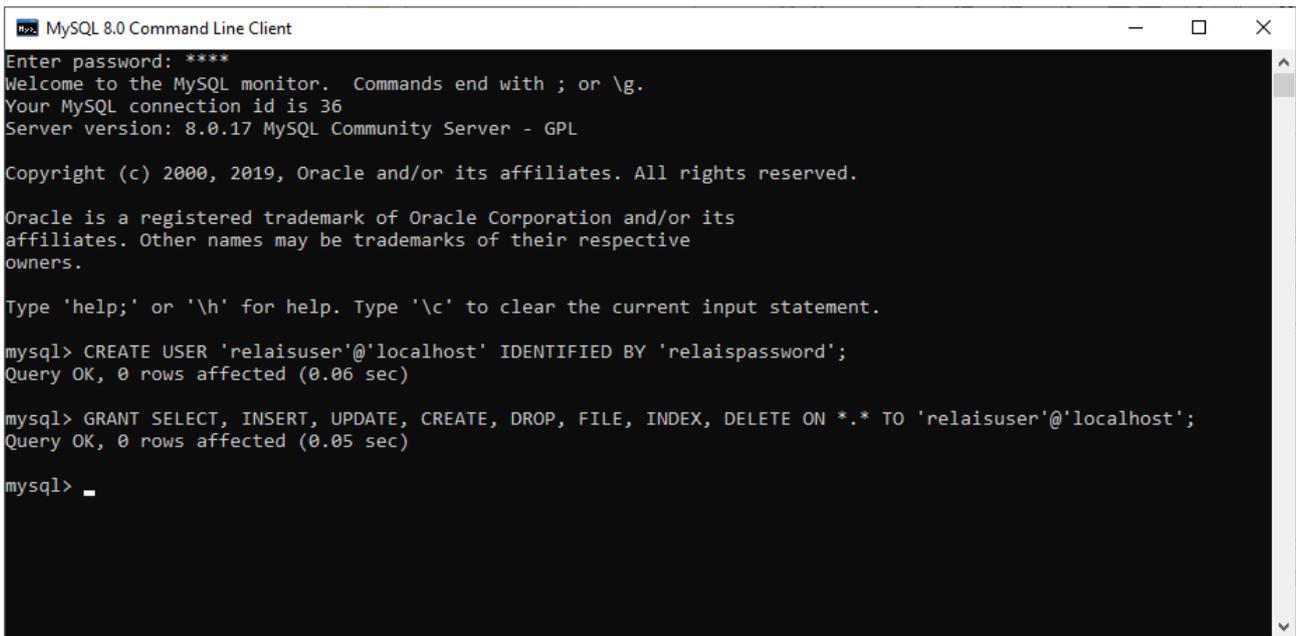
Otherwise RELAIS may use the root account, but if you can't, or don't want, to use the administrative user for this proposal, you need to create a new user with specific roles.

In particular, the user requires the grants: SELECT, INSERT, UPDATE, CREATE, DROP, FILE, INDEX and DELETE.

For example, if you want use a login named 'relaisuser' with password 'relaispassword' you can to connect at MySql instance using the root account. Then you must execute the following commands:

```
CREATE USER 'relaisuser'@'localhost' IDENTIFIED BY 'relaispassword';  
  
GRANT SELECT, INSERT, UPDATE, CREATE, DROP, FILE, INDEX, DELETE ON *.* TO  
  'relaisuser'@'localhost';
```

In Figure 12 the successful creation of a MySQL user account for RELAIS.



```
MySQL 8.0 Command Line Client
Enter password: ****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 36
Server version: 8.0.17 MySQL Community Server - GPL

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Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE USER 'relaisuser'@'localhost' IDENTIFIED BY 'relaispassword';
Query OK, 0 rows affected (0.06 sec)

mysql> GRANT SELECT, INSERT, UPDATE, CREATE, DROP, FILE, INDEX, DELETE ON *.* TO 'relaisuser'@'localhost';
Query OK, 0 rows affected (0.05 sec)

mysql> _
```

Figure 12. Create a MySQL user for RELAIS

1.3.4 Configuring MySQL parameters in my.ini configuration file

In MySQL version higher than 5.5 the parameter `secure_file_priv` is used to limit the effect of data import and export operations. Relais use the command `LOAD DATA` to load input dataset then requires no limit for import. To this purpose, you must set this parameter to null value (empty string).

Practically you must edit the configuration file `my.ini` in the MySQL directory (as example: `C:\ProgramData\MySQL\MySQL Server 8.0`)

In the section related to the `mysqld` service, it is necessary to modify the line for configuration of the `secure-file-priv` parameter or, if this does not exist, add it as in the following example:

```
...
[mysqld]
...
secure-file-priv=""
....
```

After updating the my.ini file, you must restart the MySQL database, or the whole computer.

1.3.5 Installing MySql ODBC Driver

If MySql ODBC driver is not already installed, please download the setup file from the web. In the recent versions also this can be installed using the MySQL Installer.

If Windows SO works on 64-bit use the 64-bit version of the driver.

To run properly RELAIS does not need any special settings of the ODBC driver.

1.3.6 Creation of the 'relais' database

This step is not mandatory to run RELAIS but is recommended for an easier creation of the ODBC source (see next paragraph).

As first step, connect to MySql using the 'MySQL Command Line Client' available in MySQL Server group of the Start menu. At the password prompt use the chosen root password during the setting configuration phase.

You can use other interfaces to access the database (for example MySQL Workbench) and, if you have created a dedicated user as specified in paragraph 1.3.3, you can use the user for RELAIS instead of root.

To the MySql command prompt, that appears as shown in Figure 13, submit command:

```
create database relais;
```

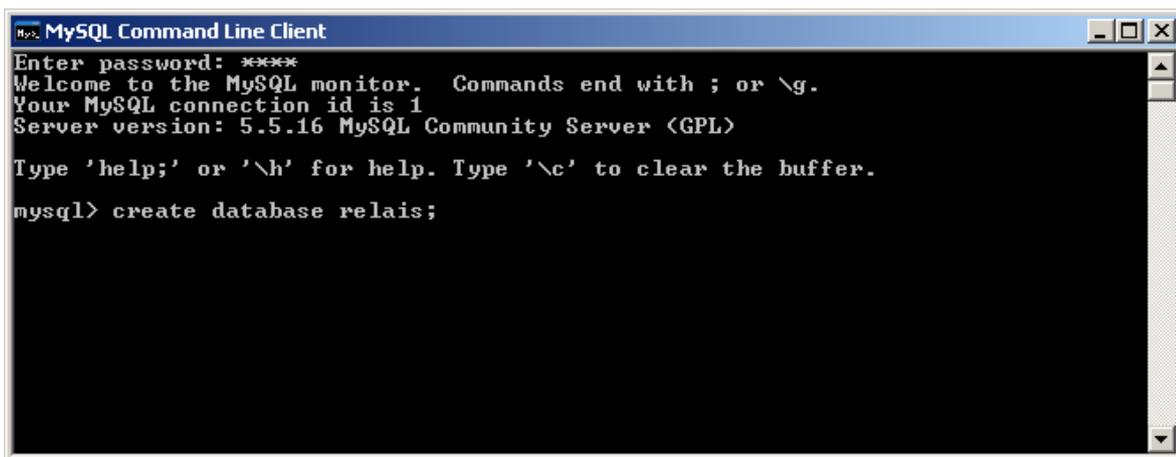


Figure 13. MySql Command Line Client

the system will respond with the message 'Query OK', now the database is created and the 'MySQL Command Line Client' can be closed.

1.3.7 Creation of the ODBC Source for MySQL instance

To create the ODB source, select the “Administrative Tools” from the “Control Panel” (as shown in Figure 14) and choose ‘Data Source (ODBC)’ on the “Administrative Tools” window that will be opened (as shown in Figure 15).

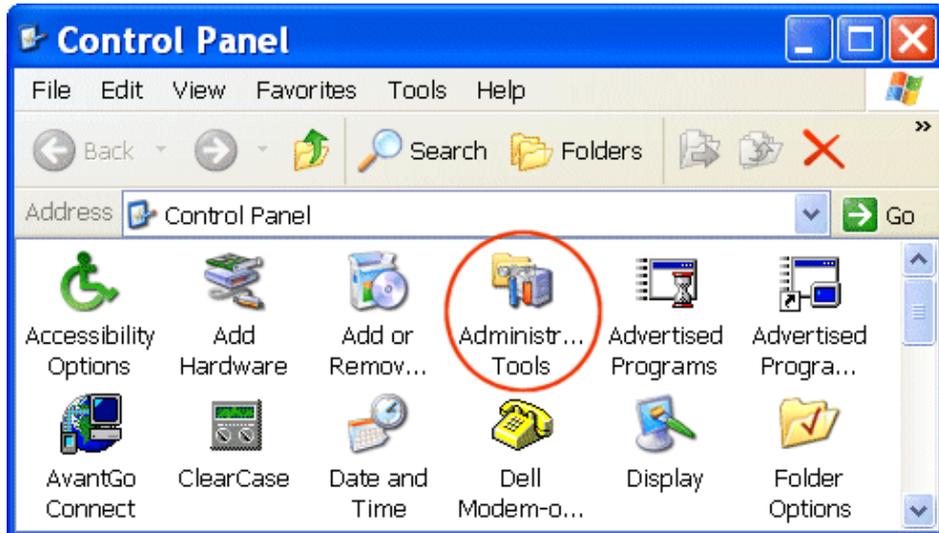


Figure 14. Control Panel

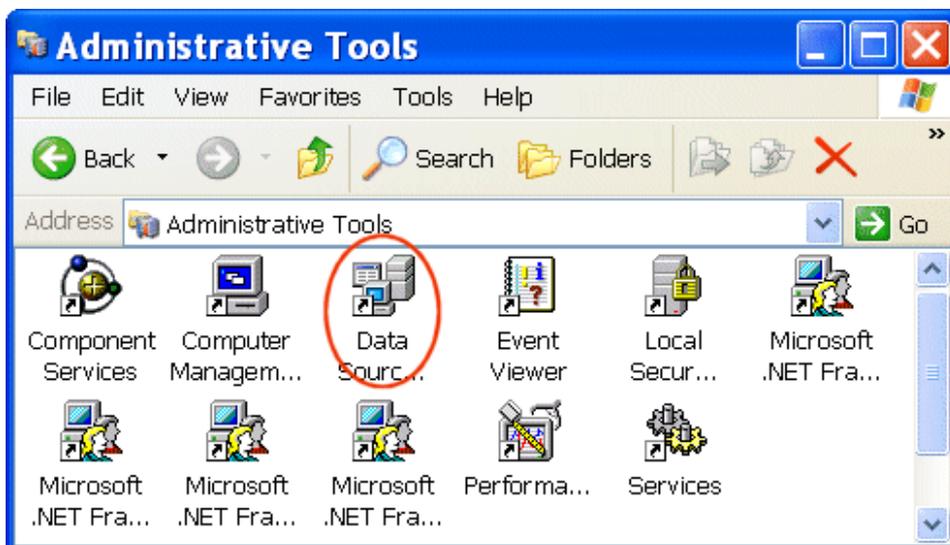


Figure 15. Administrative Tools

In the ODBC Data Source Administrator dialog box you have to choose ‘System DSN’ tabs and click on the ‘Add’ button as displayed in Figure 16.

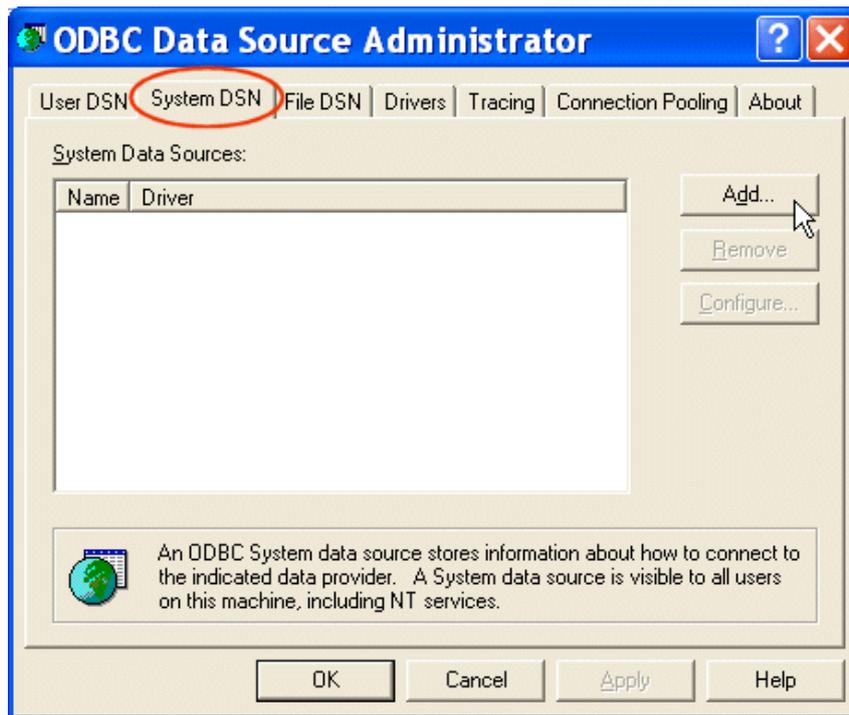


Figure 16. Data Source Administrator

Scroll down the driver list until you will find the MySQL driver as shown in (see paragraph 1.3.5 for more details).

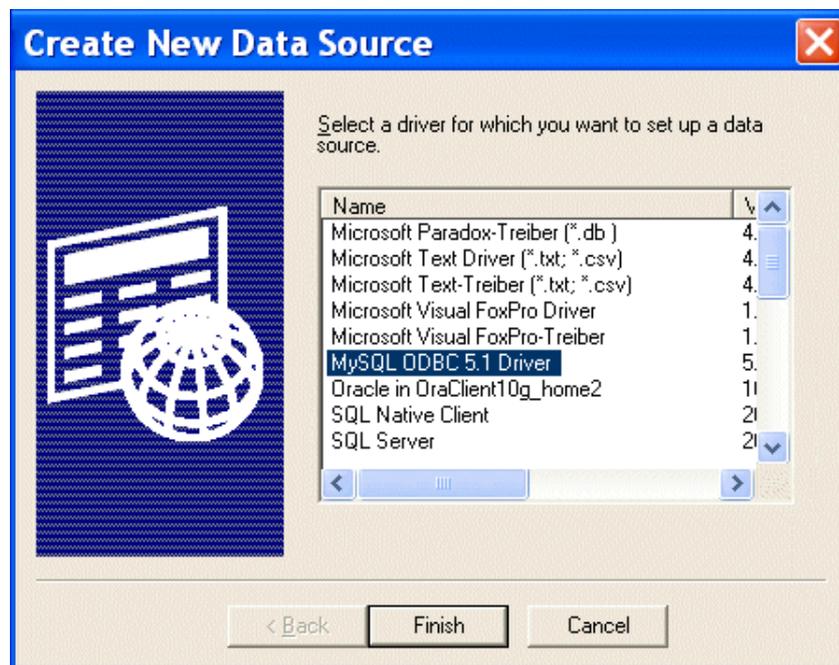


Figure 17. Create new Data source window

The ODBC Setup dialog box appears as displayed in Figure 18.

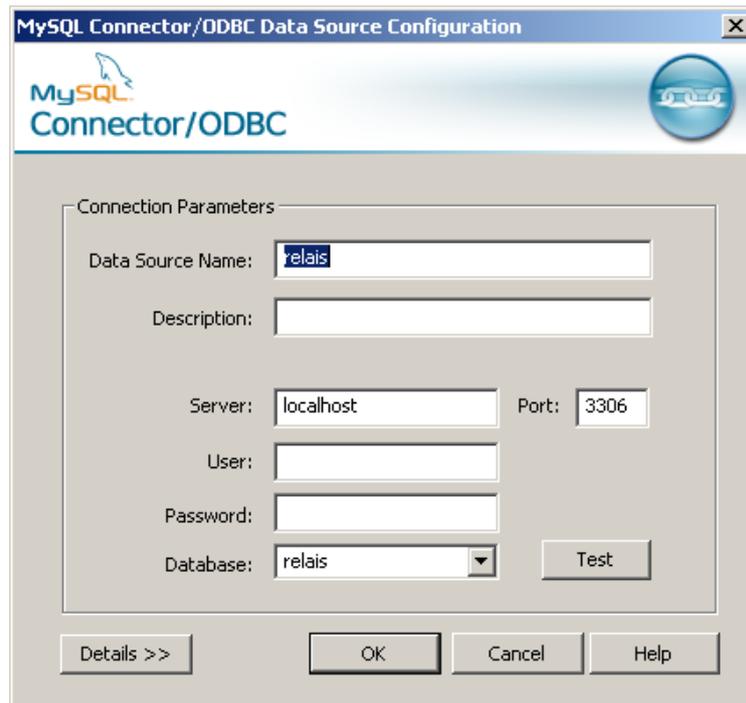


Figure 18. ODBC setup dialog box

The following settings have to be done:

- Data source name = relais
- Server = localhost
- Database = relais

The User and Password fields require the MySQL login used by RELAIS.

1. In case of anonymous account (paragraph 1.3.2), User and Password fields must be empty
2. In case of MySQL user dedicated to RELAIS (paragraph 1.3.3), the value of 'relaisuser' and 'relaispassword'
3. In case of root account
 - User = root
 - Password = value of root password

Note that: if you don't create database relais in MySQL instance (see paragraph 1.3.6) 'relais' value is not in the list of existing database and the connection test will fail.

1.4 RELAIS setup

As final step you have to run the RELAIS setup for which a minimal configuration is required.

1.4.1 RELAIS folder permission

During the setup the location of RELAIS main folder are required.

The default value is:

C:\Users\Public\Documents\Relais3.1

If you decide to locate the main folder elsewhere we recommend to check the folder permissions after the end of setup run.

To check its permission click on the right button on the directory icon and select 'Properties' from the opened menu.

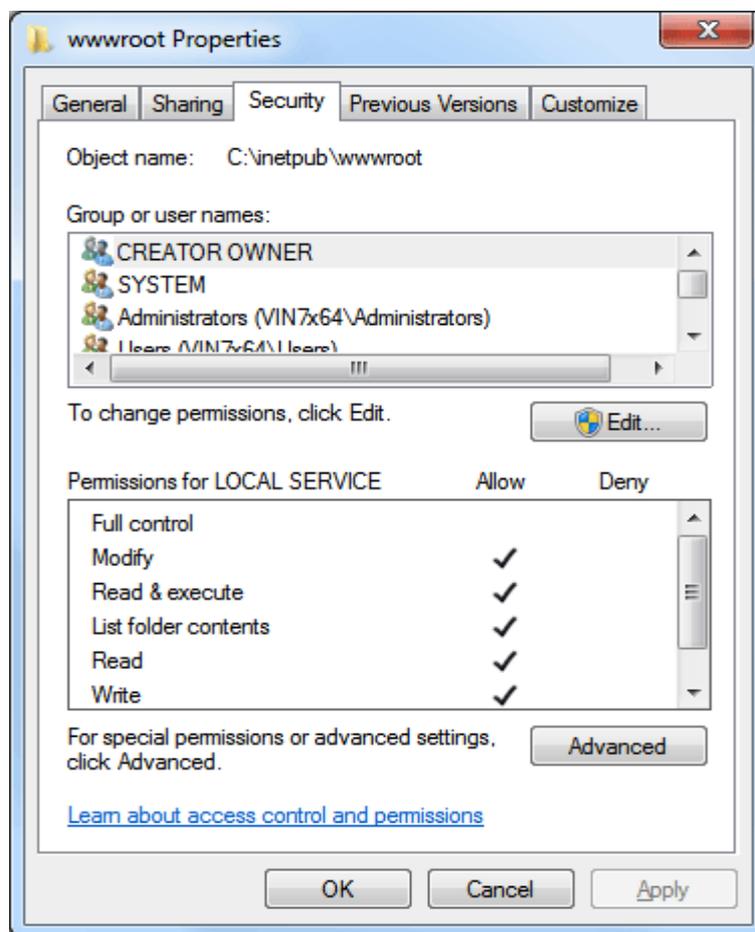


Figure 19. Folder properties

In the security folder (see Figure 19) you can verify the permissions of each group or user.

All users must be allowed to:

- Modify
- Read & execute
- Read
- Write

To change the grants, use the 'Edit' button. You can choose 'Full control' for all groups and users.

1.4.2 Configure the MySQL User for RELAIS

If you enabled the anonymous account in MySQL (see paragraph 1.3.2) no further configuration is required.

Otherwise, you need to edit the file db.config located in the RELAIS main folder. Here you may set the MySQL login. Similar to this made for the ODBC source:

1. In case of MySQL user dedicated to RELAIS (paragraph 1.3.3), you set the value of 'relaisuser' for user and the value of 'relaispassword' for password.
2. In case of root account, you set 'root' for user and the value of root password for password.

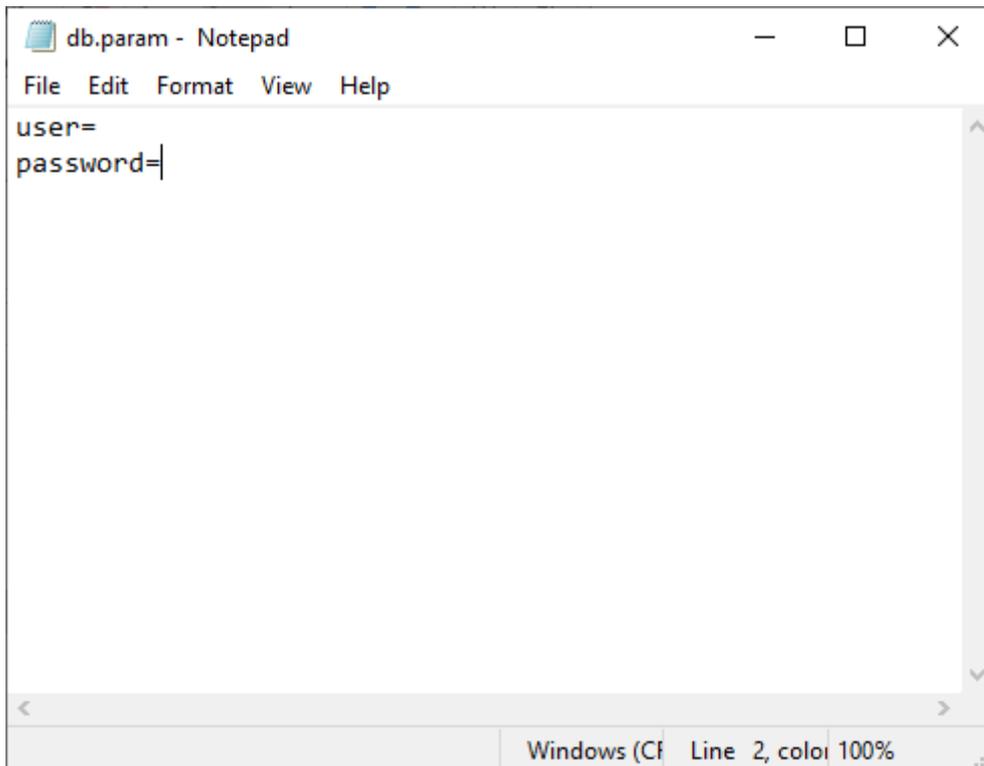


Figure 20. Editing of db.param file

2 Troubleshooting

In this section we present a list of trouble found in RELAIS running due to incorrect installation.

2.1 Troubles in launching RELAIS or in project opening

2.1.1 Error in launching RELAIS

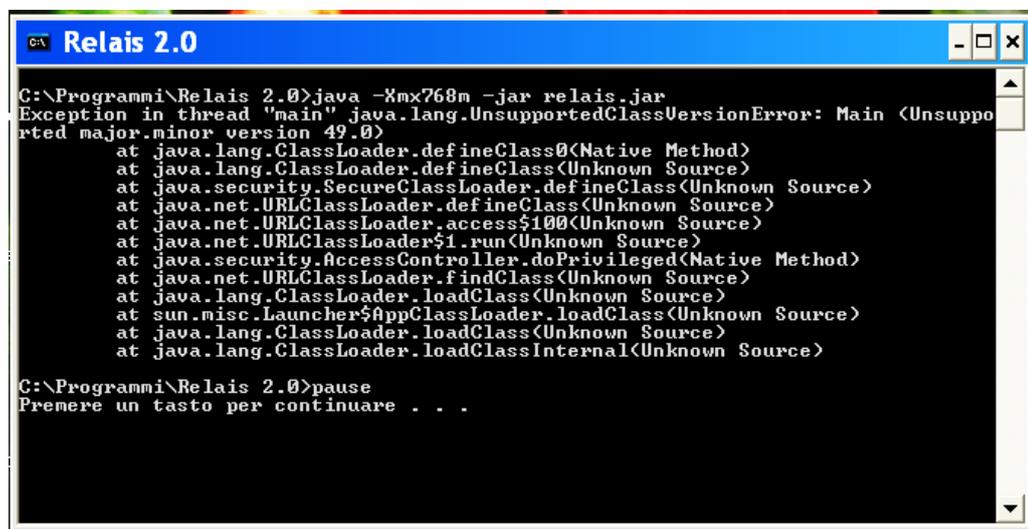
Error: Nothing happens when I launch RELAIS from desktop icon or start menu item

Possible causes and solutions:

1. The Java bin directory is not correctly added to the system variable PATH

[**Solution:** modify the system variable PATH as described in paragraph 1.1.2]

2. The Java release is not updated. RELAIS require JRE 6 and JDK 1.6 . If the command window is available the shown error message is something like this:



```
C:\Programmi\Relais 2.0>java -Xmx768m -jar relais.jar
Exception in thread "main" java.lang.UnsupportedClassVersionError: Main (Unsupported
rted major.minor version 49.0)
    at java.lang.ClassLoader.defineClass0(Native Method)
    at java.lang.ClassLoader.defineClass(Unknown Source)
    at java.security.SecureClassLoader.defineClass(Unknown Source)
    at java.net.URLClassLoader.defineClass(Unknown Source)
    at java.net.URLClassLoader.access$100(Unknown Source)
    at java.net.URLClassLoader$1.run(Unknown Source)
    at java.security.AccessController.doPrivileged(Native Method)
    at java.net.URLClassLoader.findClass(Unknown Source)
    at java.lang.ClassLoader.loadClass(Unknown Source)
    at sun.misc.Launcher$AppClassLoader.loadClass(Unknown Source)
    at java.lang.ClassLoader.loadClass(Unknown Source)
    at java.lang.ClassLoader.loadClassInternal(Unknown Source)

C:\Programmi\Relais 2.0>pause
Premere un tasto per continuare . . .
```

[**Solution:** install required releases as described in paragraph 1.1.1]

2.1.2 Error in opening a new project

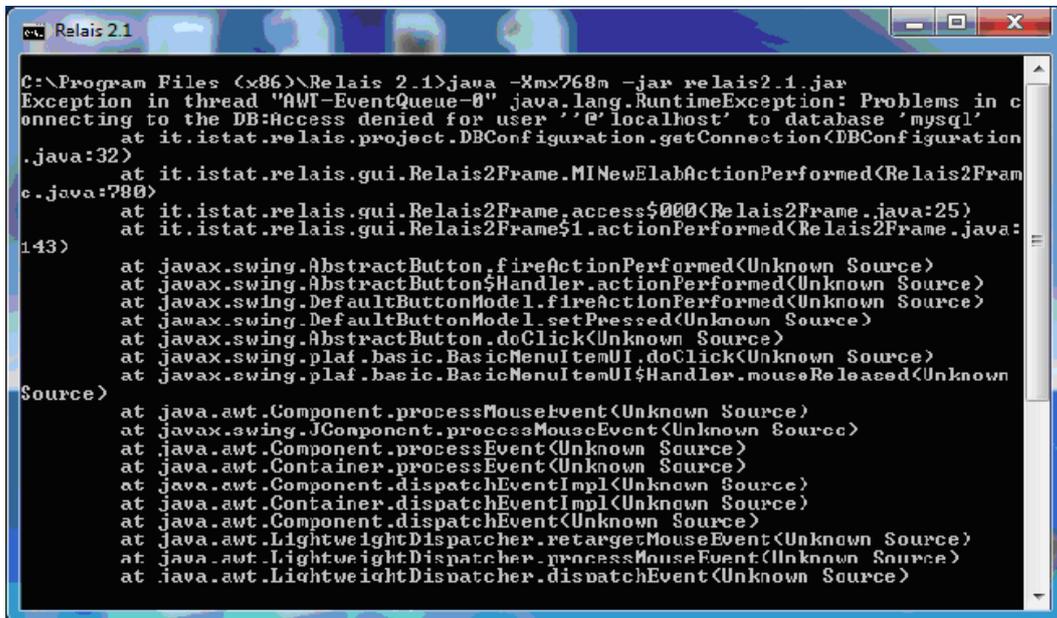
Error: An error occurs when I try to Open a new project (or Noting happens)

Possible causes and solutions:

1. MySQL Server is not installed in you PC

[**Solution:** install MySQL Server as described in paragraph 1.3.1]

2. Anonymous account is not enabled for your MySQL instance. The RELAIS screen show this message: “Problem in connecting to the DB:Access denied for user ‘’@localhost”, in the command window an error message like this appears:



```
C:\Program Files (x86)\Relais 2.1>java -Xmx768m -jar relais2.1.jar
Exception in thread "AWT-EventQueue-0" java.lang.RuntimeException: Problems in c
onnecting to the DB:Access denied for user ''@localhost' to database 'mysql'
    at it.istat.relais.project.DBConfiguration.getConnection(DBConfiguration
.java:32)
    at it.istat.relais.gui.Relais2Frame.MINewElabActionPerformed(Relais2Fram
e.java:780)
    at it.istat.relais.gui.Relais2Frame.access$5000(Relais2Frame.java:25)
    at it.istat.relais.gui.Relais2Frame$1 actionPerformed(Relais2Frame.java:
143)
    at javax.swing.AbstractButton.fireActionPerformed(Unknown Source)
    at javax.swing.AbstractButton$Handler.actionPerformed(Unknown Source)
    at javax.swing.DefaultButtonModel.fireActionPerformed(Unknown Source)
    at javax.swing.DefaultButtonModel.setPressed(Unknown Source)
    at javax.swing.AbstractButton.doClick(Unknown Source)
    at javax.swing.plaf.basic.BasicMenuItemUI.doClick(Unknown Source)
    at javax.swing.plaf.basic.BasicMenuItemUI$Handler.mouseReleased(Unknown
Source)
    at java.awt.Component.processMouseEvent(Unknown Source)
    at javax.swing.JComponent.processMouseEvent(Unknown Source)
    at java.awt.Component.processEvent(Unknown Source)
    at java.awt.Container.processEvent(Unknown Source)
    at java.awt.Component.dispatchEventImpl(Unknown Source)
    at java.awt.Container.dispatchEventImpl(Unknown Source)
    at java.awt.Component.dispatchEvent(Unknown Source)
    at java.awt.LightweightDispatcher.retargetMouseEvent(Unknown Source)
    at java.awt.LightweightDispatcher.processMouseEvent(Unknown Source)
    at java.awt.LightweightDispatcher.dispatchEvent(Unknown Source)
```

[**Solution:** Remove instance and create new instance with anonymous account as described in paragraph 1.3.2 or use the db.param configuration file for the database connection as described in paragraph 1.4.2]

2.2 Troubles in probabilistic decision model performing

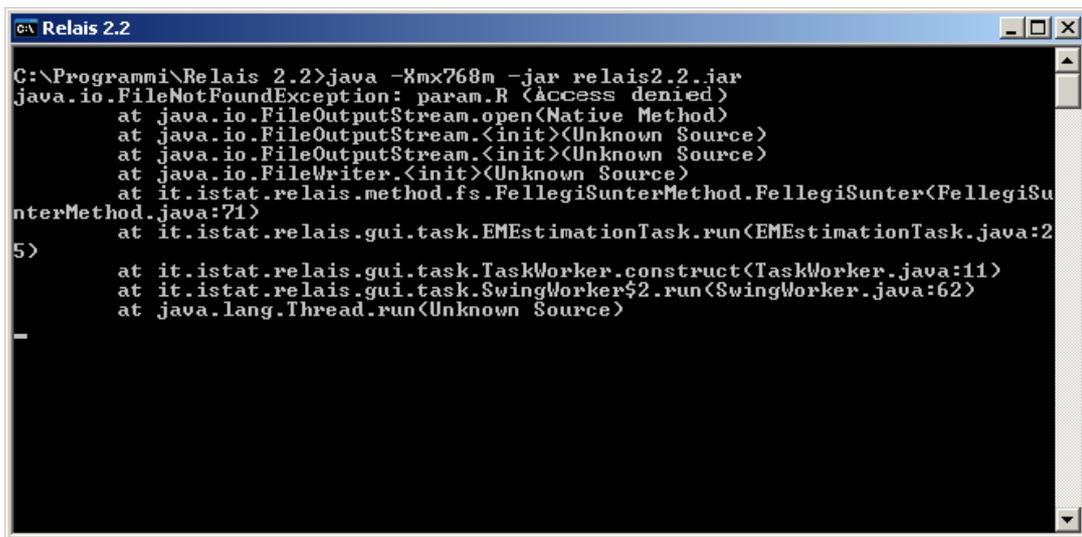
2.1.2 Error EM Estimation task failed

Error: This error occurs when I use the ‘EM Estimation’ in probabilistic Fellegi-Sunter decision model



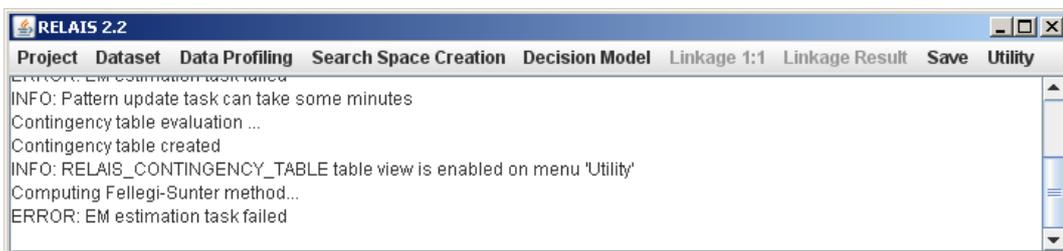
Possible causes and solutions:

1. Insufficient permissions allow for RELAIS main folder. In the command window an error message like this appears:



[Solution: Allow required permission on folder as described in paragraph 1.4.1]

Error: This error occurs when I use the 'EM Estimation' in probabilistic Fellegi-Sunter decision model



Possible causes and solutions:

1. R is not installed in you PC

[Solution: install R as described in paragraph 1.2.1]

- The R bin directory is not correctly added to the system variable. In the command window an error message like this appears:

```

C:\Programmi\Relais 2.2>java -Xmx768m -jar relais2.2.jar
java.io.IOException: Cannot run program "RSCRIPT": CreateProcess error=2, The
system cannot find the file specified
    at java.lang.ProcessBuilder.start(Unknown Source)
    at java.lang.Runtime.exec(Unknown Source)
    at java.lang.Runtime.exec(Unknown Source)
    at java.lang.Runtime.exec(Unknown Source)
    at it.istat.relais.method.fs.FellegiSunterMethod.FellegiSunter(FellegiSu
nterMethod.java:110)
    at it.istat.relais.gui.task.EMEstimationTask.run(EMEstimationTask.java:2
5)
    at it.istat.relais.gui.task.TaskWorker.construct(TaskWorker.java:11)
    at it.istat.relais.gui.task.SwingWorker$2.run(SwingWorker.java:62)
    at java.lang.Thread.run(Unknown Source)
Caused by: java.io.IOException: CreateProcess error=2, Impossibile trovare il fi
le specificato
    at java.lang.ProcessImpl.create(Native Method)
    at java.lang.ProcessImpl.<init>(Unknown Source)
    at java.lang.ProcessImpl.start(Unknown Source)
    ... 9 more

```

[**Solution:** modify the system variable PATH as described in paragraph 1.2.2]

Error: This error occurs when I use the ‘EM Estimation’ in probabilistic Fellegi-Sunter decision model

Possible causes and solutions:

- Required R packages (‘lpSolve’ and ‘RODBC’) are not installed. In the file RMessage.Rout (located in the RELAIS main folder) an error message like this appears:

```

Error in library("RODBC") : there is no package called 'RODBC'

```

[**Solution:** install all required R packages as described in paragraph 1.2.3]

- The ODBC source is not correctly created. In the file RMessage.Rout (located in the RELAIS main folder) an error message like this appears:

```

[...]

ODBC connection failed

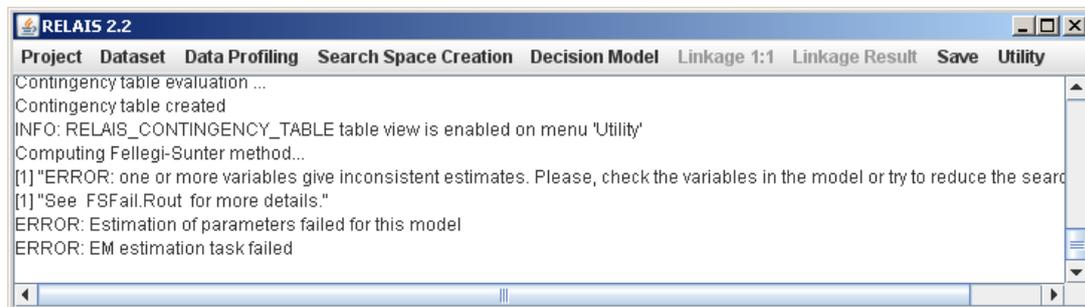
Error in sqlQuery(con, strInput) :

```

first argument is not an open RODB channel

[**Solution:** configure the ODBC source as described in paragraph 1.3.7]

Error: This error occurs when I use the 'EM Estimation' in probabilistic Fellegi-Sunter decision model



Possible causes and solutions:

This is not an error due to incorrect installation. The software runs correctly but the model does not have enough information to a reliable estimate. Please refer to user guide to treat this case.