School of Information and Communication Technology

Griffith University

3821ICT – WIL Single Project

Improving the efficiency and effectiveness of large-scale extraction of electricity demand data published by AEMO as part of the 2022 Integrated System Plan (ISP).

User Manual

Unisoft

[2022 (Trimester:- 2)]

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Table of Contents

1.0 Summary

The user manual is split into 5 sections each with a different purpose.

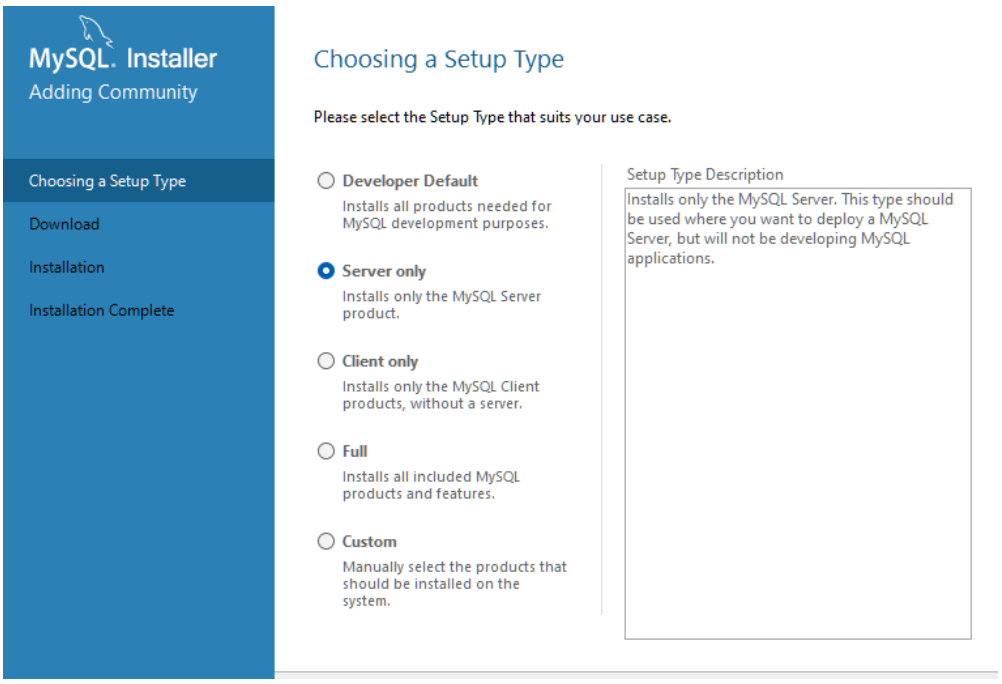
1. The installation guide will run through how to get the program running and functioning correctly. How to run the code and install mySQL will be explained.
2. Each function of the program will be explained in detail to give an overview of how each part works.
3. The overall operation of the program will be explained and common uses will be demonstrated
4. Licensing information will be provided for each third party package that was used.
5. Additional information will be provided.

2.0 Installation

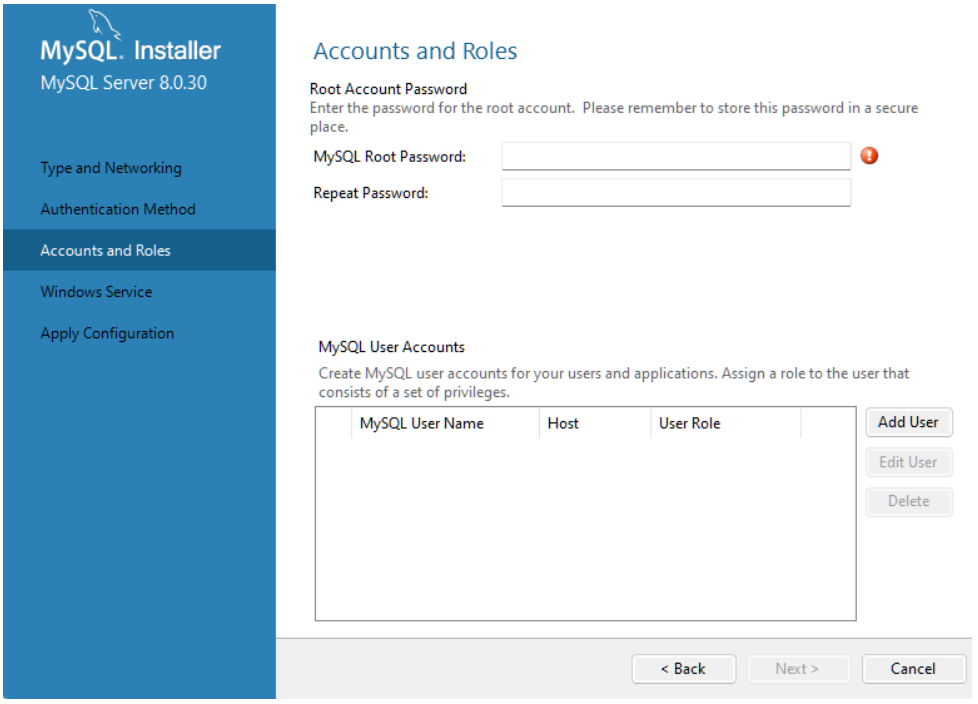
2.1 mySQL

If the user is planning to run the database locally, mySQL will need to be installed. The installation file for mySQL can be found below.
https://dev.mysql.com/get/Downloads/MySQLInstaller/mysql-installer-community-8.0.30.0.msi
mySQL also requires the installation of Microsoft Visual C++ Redistributable which can be obtained from the link below
https://aka.ms/vs/17/release/vc_redist.x64.exe

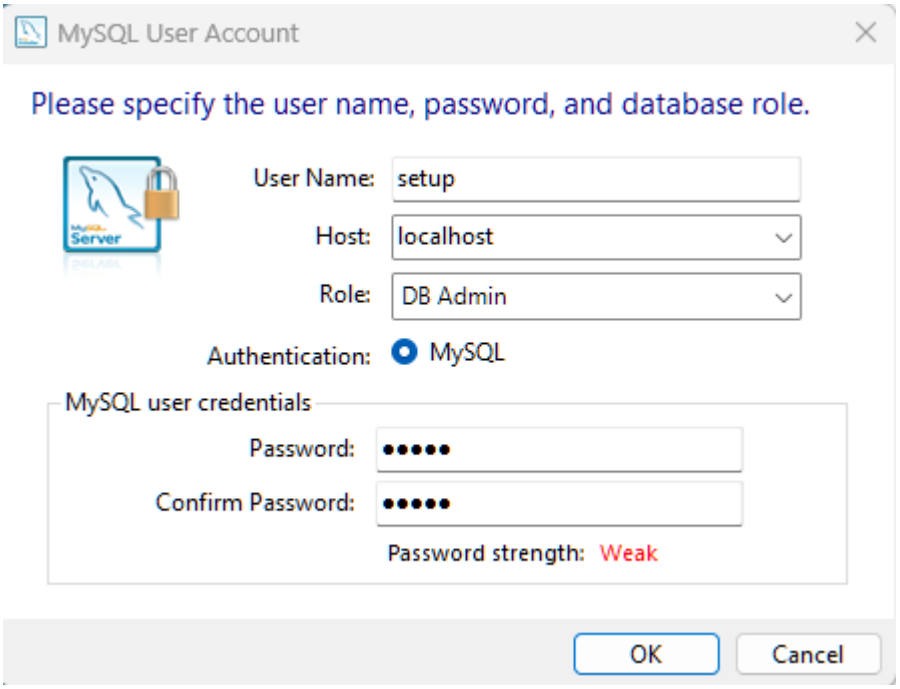
1. When asked which components should be installed, install the mySQL server.



2. Click next until this page is reached.



3. Enter a password. Make sure to remember it!
4. Click add user on the right hand side.
5. Make selections as follows, using whatever username and password you will use to login from the program Then click OK. This step can be repeated as many times as necessary (suggested once for each user but a single login can be shared).



6. Continue until the install is complete using the default settings.
7. Open the mySQL Command Line Client.
8. Enter the following command to create the database:
    a. DATABASE CREATE demand;
9. Run the setup python script.

2.2 Running the Program

1. Run the main program.
2. Enter the ip of the database (127.0.0.1 if the database is running locally)

3.0 Functions

3.1 Loading a File

3.1.1 Selecting the File

When ‘load file’ is clicked, a file window will open allowing the user to select the file from files on their system. Selecting a file and clicking “select” will then open the confirmation box.

3.1.2 Confirmation Box

The confirmation box will open once a file is selected. The confirmation box gets the user to enter the information the database will use to recognise the data being loaded. The user is required to enter in

the region, scenario, component and year of the file being loaded. This ensures the system knows how to categorise the data. It also allows the user to specify the subregion the data belongs to if applicable.

3.1.3 Selecting Separator

The file separator can be chosen by the user by typing it into the separator box. This allows the user to load files that have a range of symbols separating their data. By default the separator is a comma.

3.1.4 String Classifier

The string classifier allows the user to select what defines a string in a file. By default the value is a quotation mark.

3.2 Loading the data from the database with queries.

3.2.1 Selecting the Region

The region can be selected using the drop down menu which is automatically filled in with the available regions from the files loaded into the database. Once the region is selected, the other drop down menus will populate to show more options.
Example: QLD

3.2.2 Selecting the Scenario

The scenario can be selected using the drop down menu that is automatically populated when a region is selected.
Example: Step_Change_POE10

3.2.3 Selecting the Component

The component can be selected using the drop down menu that is automatically populated when a region is selected.
Example: Electrified_Bus

3.2.4 Selecting the Year

The year can be selected using the drop down menu that is automatically populated when a component is selected.
Example: 2011

3.2.5 Range Selector

The user is able to select if they would like to pull the data from files in a range of years. The user can click the ‘range’ check box and then select an upper bound for the range they wish to display.

3.2.6 Selecting a Date and Time Range

The date and time range can be selected by using the calendars and spinboxes. The first calendar and spinbox can be used to select the start of the date and time range. The second calendar and spinbox can be used to select the end of the date and time range. Once the date ranges are selected, the submit button can be pressed to save the date selected. This will allow for the user to read

3.2.7 Selecting Sub-Regional Data

The use of sub-regional data can be chosen by ticking the box labelled ‘subregion’. If the box is selected, the subregional data will be used; if not then the subregional data will not be used.

3.2.8 Custom Queries

Custom queries can be used to query the database in any way that sql allows while the default options do not. The user can type their custom queries into the box provided and then click submit to display the results of the given query.

3.2.9 Deleting Data

The user can click ‘delete selection’ to delete the selected data from the database.

3.3 Displaying the Data

3.3.1 Running the Query

Once all the selections have been made, the user can click ‘run query’ to display the data. The data will pop up in a separate window so that the user can scroll through all the data selected.

3.3.2 Clearing the Query

If the user makes a mistake in their selections, they can click the ‘clear’ button to clear all the selections that have been made. This allows the user to make new selections.

3.4 Printing to a File

3.4.1 Printing to a CSV

In the display window, the user can click ‘print to CSV’. This will create a new CSV file that the user can then open from outside the program.

3.4.2 Printing to an Excel document

In the display window, the user can click ‘print to Excel’. This will create a new excel document that the user can then open in excel and edit externally.

3.4.3 Printing to a space-delimited text file

In the display window, the user can click ‘print to text. This will create a new text file that the user can then open in any text editor.

3.4.4 Selecting a Name

When any of the print options are chosen, the user will be prompted to choose a name for the file. The chosen name does not have to include the file extension (.xlsx, .csv, .txt) as these are automatically generated by the program.

4.0 Operation

4.1 GUI

4.1.1 Loading a File

Below is a step-by-step guide on loading a file.

1. Click the load file button from the main menu.
2. Use the window to select the file that needs to be loaded.
3. Type in the region name that matches the file e.g QLD.
4. Type in the scenario name that matches the file e.g STEP_CHANGE_POE10.
5. Type in the component name that matches the file e.g ELECTRIFIED_BUS.
6. Type in the year that matched the file e.g 2011.
7. Tick the box if the file is a sub region and enter what the file is a subregion is of e.g NSW.
8. Click the confirm box to load the file into the database.

An item at each stage of the database should only occur once. There should not be multiple instances of the same region, scenario, etc. unless they are under different directories IE the scenario "STEP_CHANGE_POE10" can occur multiple times but only once under each region.

IF a later publication includes a similar or updated version of an existing file then the user must give that new entry a unique name somewhere EG region 'QLD' becomes 'QLD1'. **Years should only be integer numbers so make the change elsewhere.**

4.1.2 Making a Query

1. Select the desired region for the query to the database.
2. Select the desired scenario for the query to the database.
3. Select the desired component for the query to the database.
4. Select the desired year for the query to the database.
    a. Select a date and time range for the query to the database.
5. Select if the query should include subregional data.
6. Add the selection to the selection list.
    a. Optionally, click the custom query but to create a custom query and add it to the selection.
7. Repeat steps 1-5 until all selections needed are made.
8. Click run query, a new window should open showing the list of data given by the selections.
9. The data can be scrolled through both horizontally and vertically to allow viewing all the data.
10. Each column can be expanded if the data does not fit in the default size.

4.1.3 Printing to a File

1. Once the data display window is open the user is able to choose if they want to print the data to a file.
2. Select print to CSV
    a. Enter a name for the file excluding the file extension.
    b. A new file will be created in the CSV format.

    c. The file can be opened using any text editor or by using specialised programs such as excel.
3. Select print to excel.
    a. Enter a name for the file excluding the file extension.
    b. A new file will be created in the Excel format.
    c. The file can be opened and modified using excel.
4. Select print to Text.
    a. Enter a name for the file excluding the file extension.
    b. A new space delimited text file.
    c. The file can be opened using any text editor

4.2 Command-Line

1. Open a command terminal at the location of the python script.
2. Start the command by entering in the program name and login information.
    a. For example: program.exe [hostname/ip] [username] [password] <arguments>
3. Commands can be entered by putting two dashes (--) and then your command after the login information.
4. Change the separator
    a. --separator [character]
    Whitespace characters can be given in the python format of \t for tabs and \n for newline characters.
    Only one character can be used as a separator so if you give a string like “abc” the separator will be ‘a’
5. Change the string classifier
    a. --stringclassifier [character]
    Whitespace characters can be given in the python format of \t for tabs and \n for newline characters.
    Only one character can be used as a separator so if you give a string like “abc” the separator will be ‘a’
6. Change the date range
    a. --datetime [year] [month] [day] [hour] [minute] [second] [year] [month] [day] [hour] [minute] [second]
    Start range first then end of range.
7. Insert data into the database by loading a file.
    a. --insert [filepath] [region] [subregion] [scenario] [component] [year]
    [subregion] is the name of the region that the given region is a subregion of.
    Incorrect usage of this can result in regions of identical names but are subregions of different regions.
    Use the --search function to verify the correct entry.
8. Delete data from the database
    a. --delete [region] [subregions? ('True' or 'False')] [scenario] [component] [year]
9. Query the database
    a. --query [n] [[region] [subregions? ('True' or 'False')] [scenario] [component] [year]] [type ('excel'/'csv'/'txt')] [output file name]

    Where [n] informs how many entries to load/how many instances of [[region] [subregions? ('True' or 'False')] [scenario] [component] [year]] to expect
10. Search the database

    a. --search / [region]/ [region] [scenario]/ [region] [scenario] [component]/ [region] [scenario] [component] [year]
11. Perform a custom query on the database
    a. --custom [SQL]

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```

6.0 Additional Information

6.1 Example Custom Queries

SHOW TABLES
returns all tables in the demand database

SELECT * FROM region
returns all regions

SELECT year_id, candidate_year FROM year WHERE candidate_year = 2018
returns all 2018 entries

SELECT scenario_id, name FROM region WHERE region_id = 1 AND name = 'STEP_CHANGE_POE10'
returns all scenarios named "STEP_CHANGE_POE10" and region_id = 1.

6.2 Example Command-line Arguments

Search function examples:
127.0.0.1 username password --search
returns all regions

127.0.0.1 username password --search QLD
returns all scenarios under the region 'QLD'

127.0.0.1 username password --search QLD STEP_CHANGE_POE10
returns all components under the region 'QLD', and the scenario 'STEP_CHANGE_POE10'

127.0.0.1 username password --search QLD STEP_CHANGE_POE10 CLI
returns all years under the region 'QLD', and the scenario 'STEP_CHANGE_POE10', and the component 'CLI'

127.0.0.1 username password --search QLD STEP_CHANGE_POE10 CLI 2015
returns all years under the region 'QLD', and the scenario 'STEP_CHANGE_POE10', and the component 'CLI', and the year '2015'. There should only ever be one result to a search so deep as the system should not allow any exact duplicates.

Insert function examples:
127.0.0.1 username password --insert file.csv QLD NONE STEP_CHANGE_POE10 CLI 2012
loads file.csv into the database under region 'QLD', scenario 'STEP_CHANGE_POE10', component 'CLI', year 2012

Query function examples:

127.0.0.1 username password --query 2 QLD NONE STEP_CHANGE_POE10 CLI 2012 QLD NONE STEP_CHANGE_POE10 CLI 2013 excel output

queries selected entries and writes result to output.xlsx in the usual format