Property Investment Optimiser

User Manual

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Client

CSIR - Council for Scientific and Industrial Research

IMPAKD link

For further references see gitHub. October 23, 2016

Contents

1 Introduction **3**

2 Vision **3**

3 Background **3**

4 System Overview **4**

5 System Configuration **4**

6 Installation **5**

6.1 Prerequisites 5

6.1.1 Installing Apache Maven 7

6.1.2 Installing Glassfish Server 10

6.1.3 Installing Java JDK 11

6.1.4 Installing Netbeans 12

6.1.5 Installing Node.js 12

6.1.6 Installing PostgreSQL 13

6.2 Setting up the System 17

7 Using The System **17**

7.1 Home Page 17

7.2 Add Property 18

7.3 Property Details 19

7.4 Profile 19

1 Introduction

This document is a user manual for a Property Investment Optimizer web application. It was developed by team IMPAKD for CSIR at the University of Pretoria (2016).The code is available as open source on gitHub. Below is a walk through of the installation and guidelines on how to use the application. Advanced users who are familiar with coding are more than welcome to use their own way of installation.

2 Vision

The Property Investment Optimizer application's objective is to evaluate whether a certain rental property is worth buying. It does this by calculating the Return of Investment (ROI) of a property, which can be compared with another property's ROI, to assist a user to optimize their investment strategy according to their portfolio.

The project will assist the user by helping to answer the following questions:

- Given a certain bond (interest rate, deposit as a percentage of property value), rental (occupancy rate, agent commission, rental amount) and environmental conditions (Interest rate, inflation) what is the ROI?
- When is it better to pay a higher or lower deposit for a bond?
- Between two rental scenarios which provides the greater ROI?
- Is it better to try and pay off the bond as fast as possible by paying in extra capital?
- How does purchasing another property influence a user's ROI and at which point would this be a good idea?
- At which point does it make sense to buy another property?
- How much tax will the user have to pay?s

3 Background

The project was given to us by our client, CSIR, so that we can research how the ROI of different configurations of rental properties can answer the questions listed in the Vision section of this document. Answers to these questions can be used to help users of the system choose to buy the best property that fits their portfolio and requirements with the ease of not having to manually evaluate the property themselves. The project can also be used for property-related research.

4 System Overview

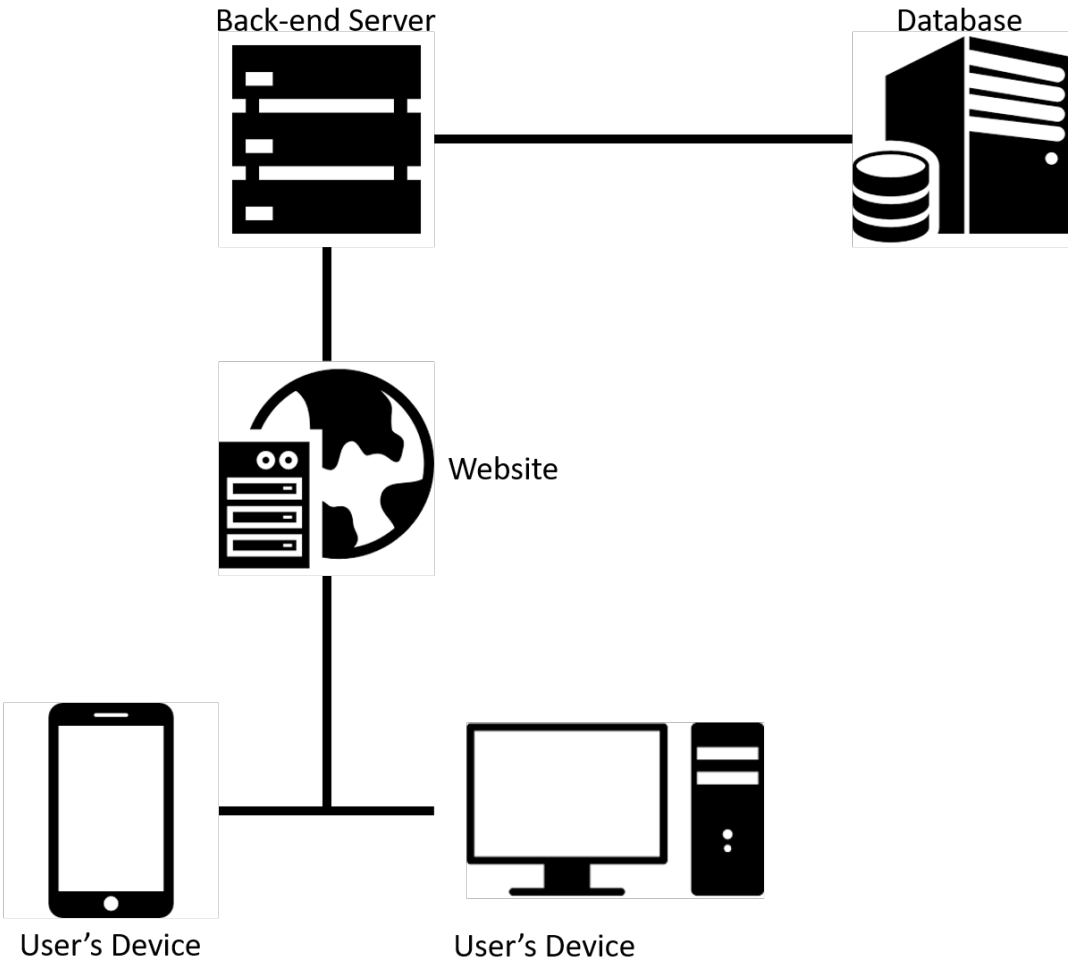
The Property Investment Optimizer application is designed to assist the user to know when is the right time to buy property and when is the right time to sell property. It also tells the user the best option to pay off a bond, which is either higher or lower. A user is allowed to add a property to calculate the property's ROI which is then added to the user's portfolio. Two properties can be compared to see which one has a better return of investment. Furthermore, the application will simulate the buying of properties. This application contains basic functionality, which is easy to use. The project is split into the back-end server and the front-end website.

5 System Configuration

A Windows/Unix based host is required to run the application's back end server. This host must have the associated technologies installed (the installation of these technologies is illustrated below). The host must have internet connectivity in order to allow any of the required dependencies to be installed and set up for the operating system environment. The back-end server runs on port 8080 and the website runs on port 8383.

The system uses REST web services to send data between the back-end server and the website. The data from the back-end server is sent in xml format and is translated to json objects on the website. From the website, the data is sent as encodedString and application-form-urlencoded media types using Ajax calls.The systems data is stored on a PostgreSQL database.

Users of the website will only be required to have a device that has a web browser and access to the internet.



6 Installation

6.1 Prerequisites

In order to use the Property Investment Optimizer system, you must install the following the technologies:

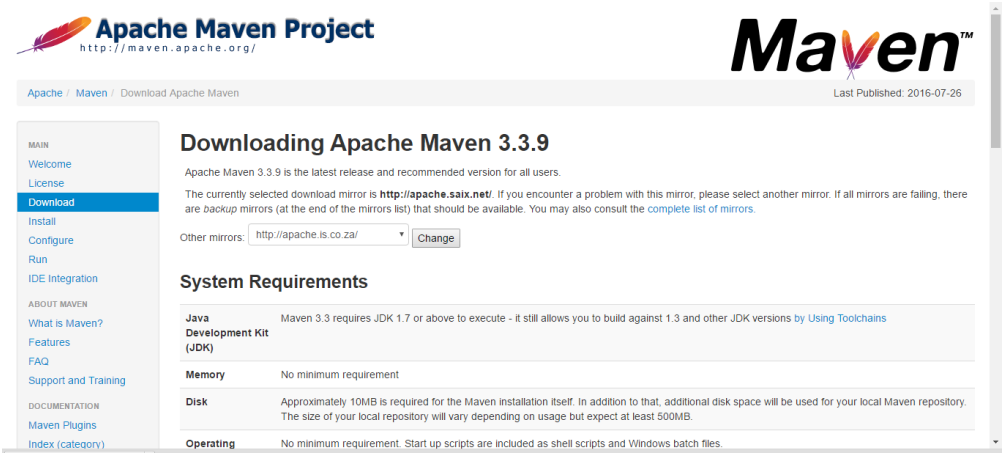
- AngularJS - link
- Apache Maven - link
- Glassfish Server - link
- Java JDK - link
- Netbeans - link
- Node.js - link

- PostgreSQL - link

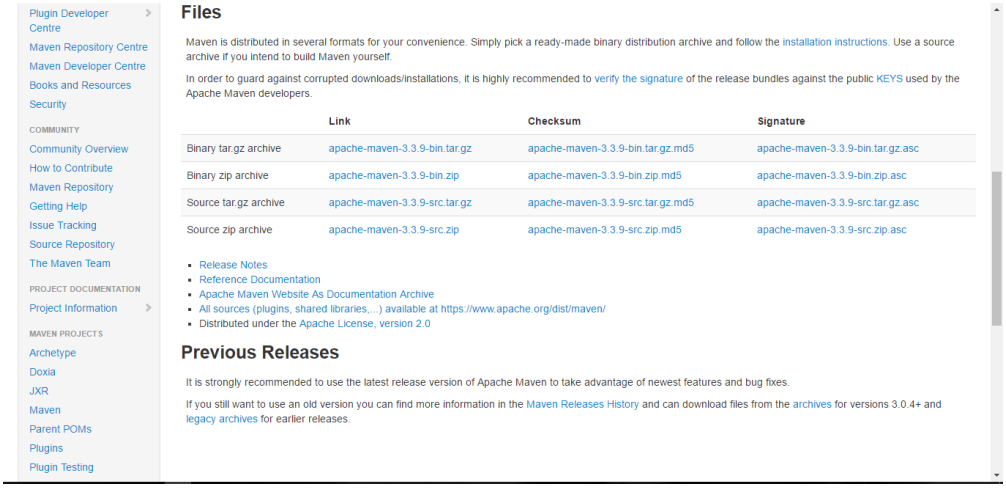
You must first download the project from the following link: Github. After you have downloaded the project, follow the instructions below to install the required technology.

6.1.1 Installing Apache Maven

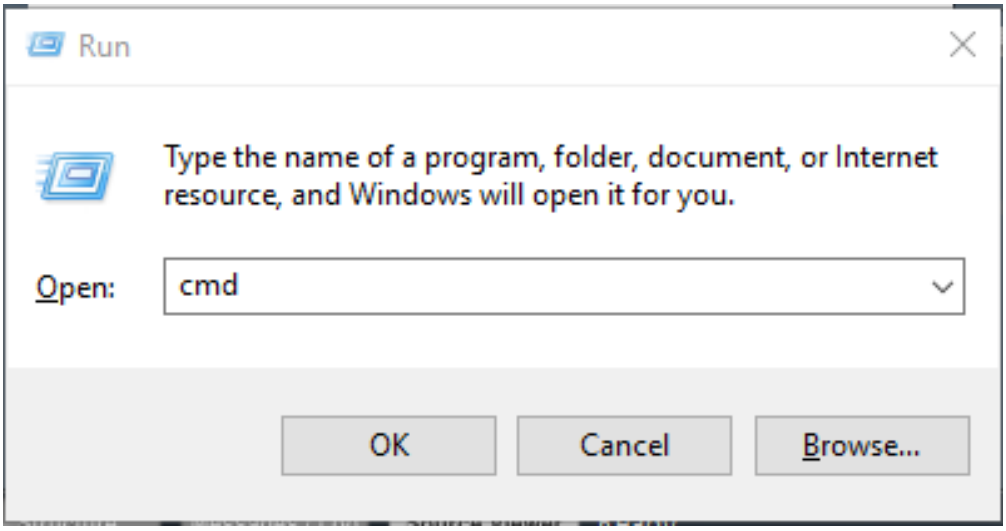
1. Go to the following link: apacheMaven link



2. Click your preferred download link under the the 'Files' Section of the page

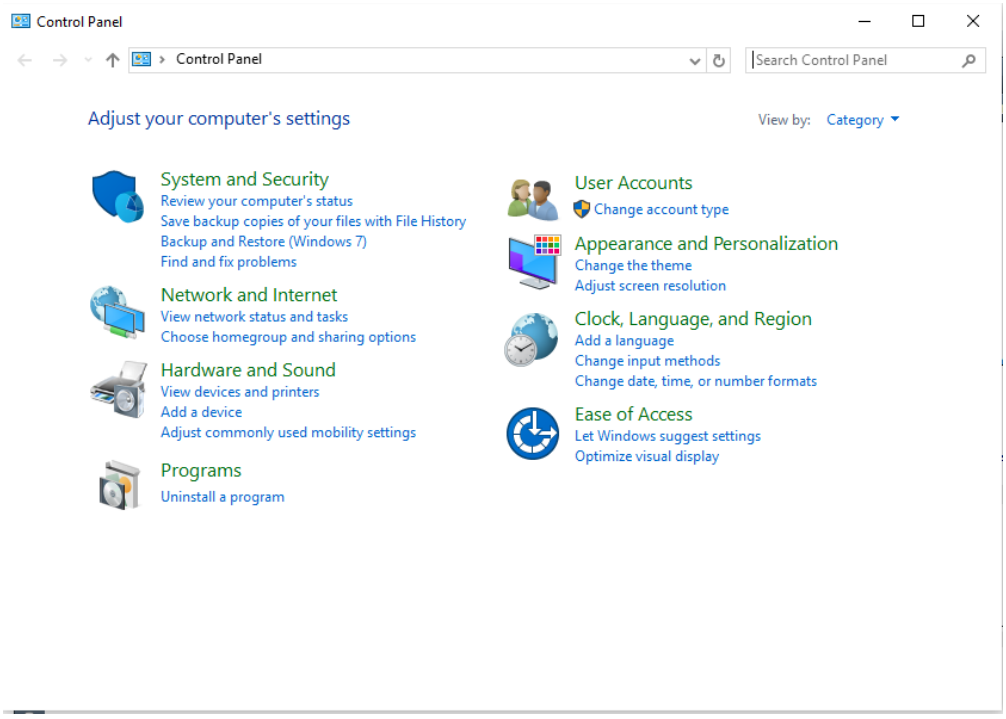


3. Open the command prompt by pressing the windows key together with the letter 'r', win+R, and type 'cmd'.

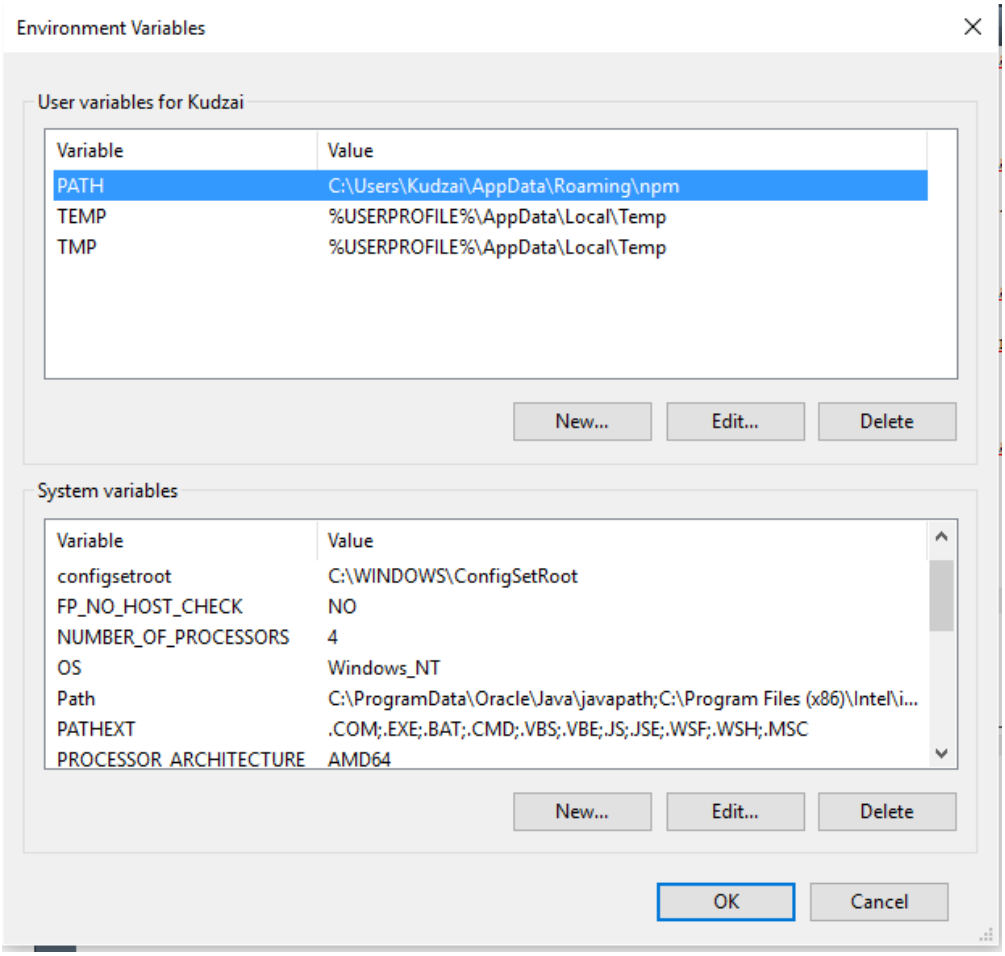


4. Once open, type the following command: unzip Apache-maven-3.3.9-bin.zip, in the folder that contains the download, to extract the data.

5. Open the Control Panel.



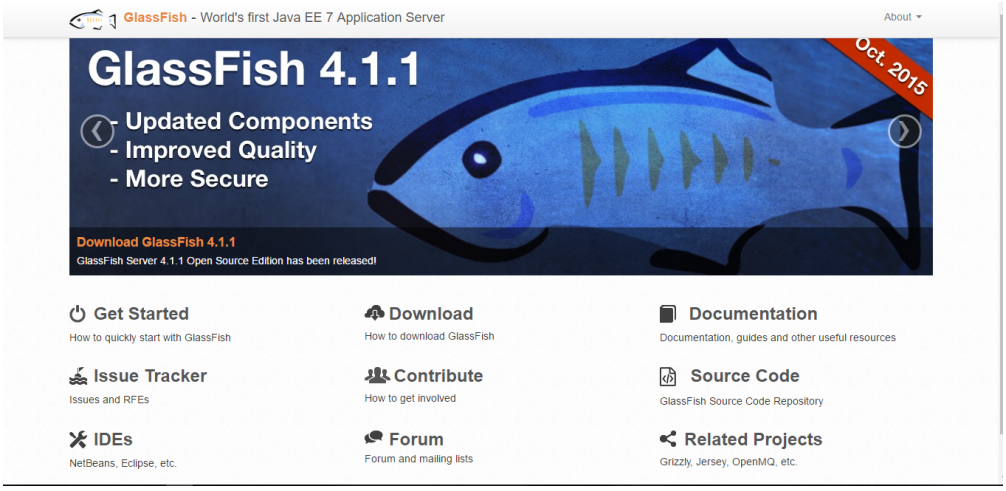
6. Select System and Security.
7. Select System.
8. Select Advanced System Settings
9. Click the Environment Variable.. button
10. Select the New button under User Variables



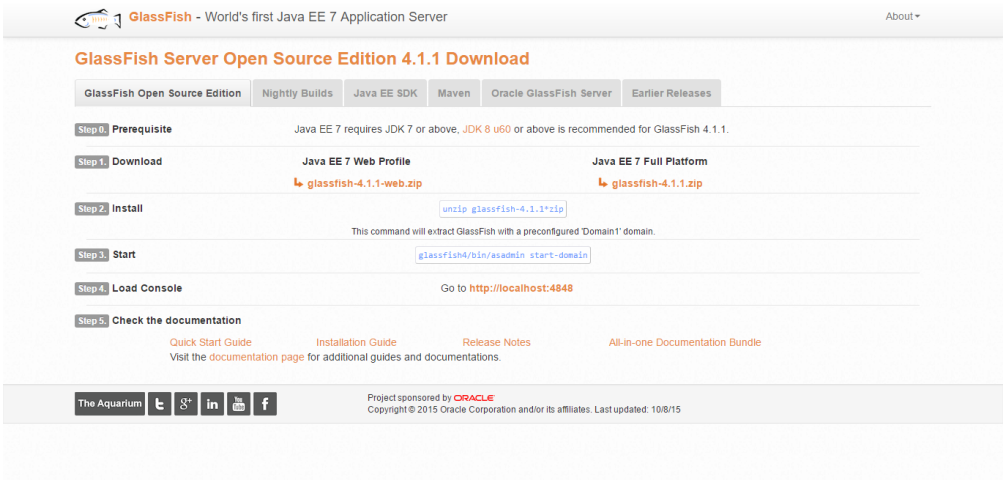
11. Add the file directory path of the 'bin' folder for Apache Maven and click OK.

6.1.2 Installing Glassfish Server

1. Go to the following link: glassfishServer link



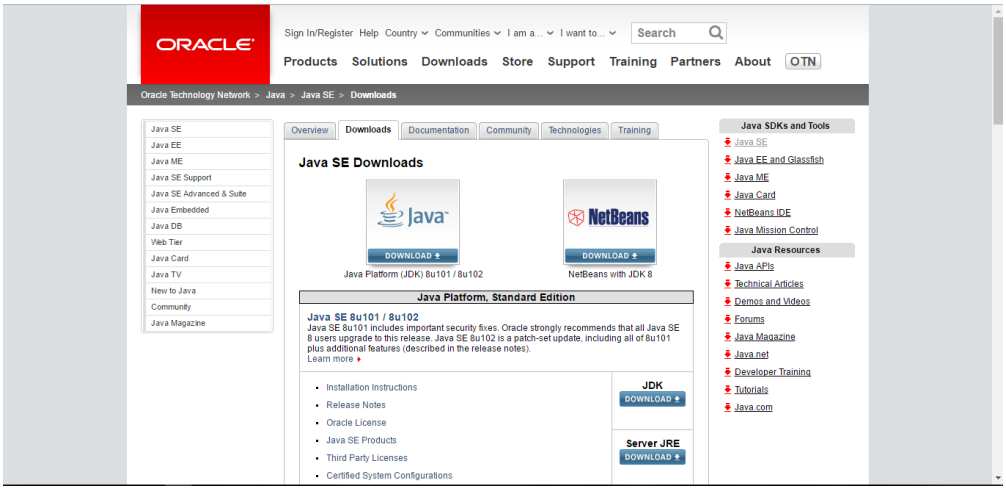
2. Click the Download link



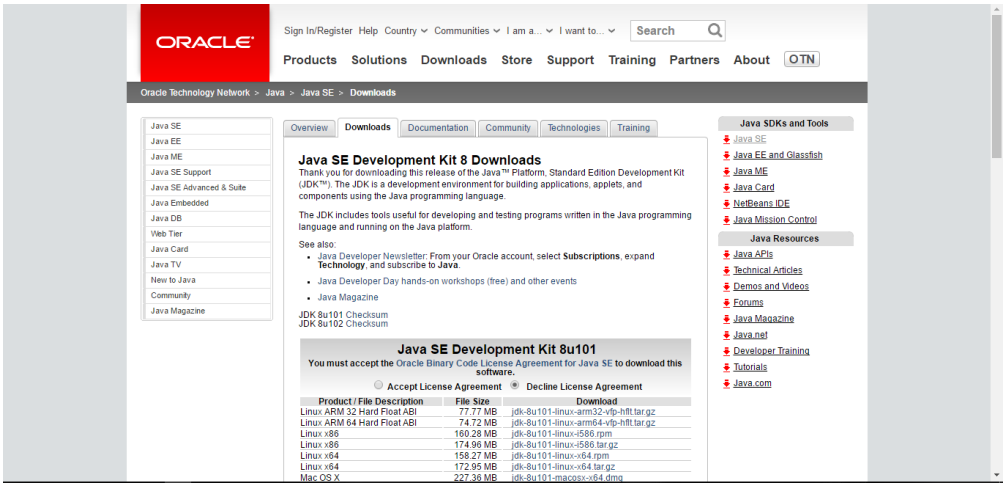
3. Download the 'Java EE 7 Full Platform' link and follow the instructions on the page.

6.1.3 Installing Java JDK

1. Go to the following link: javaJDK link



2. Click on the 'Java Platform (JDK) 8u101 / 8u102' link.

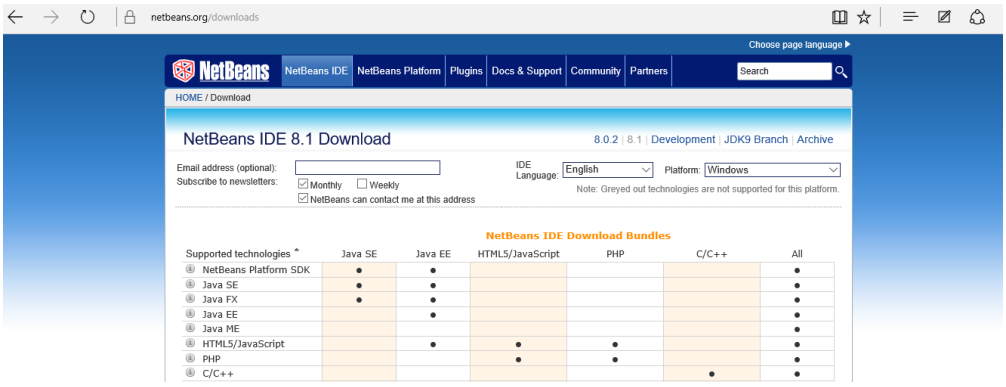


3. Select your required version and download it.

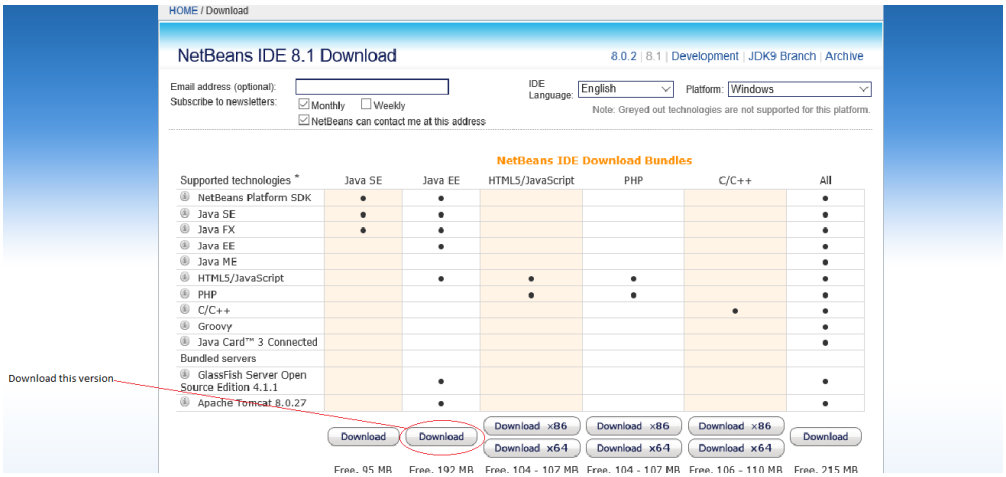
4. Once downloaded, open the installation file and follow the prompts to install it.

6.1.4 Installing Netbeans

1. Go to the following link: Netbeans link



2. download this version



3. run the downloaded .exe file and follow the prompts to install it

6.1.5 Installing Node.js

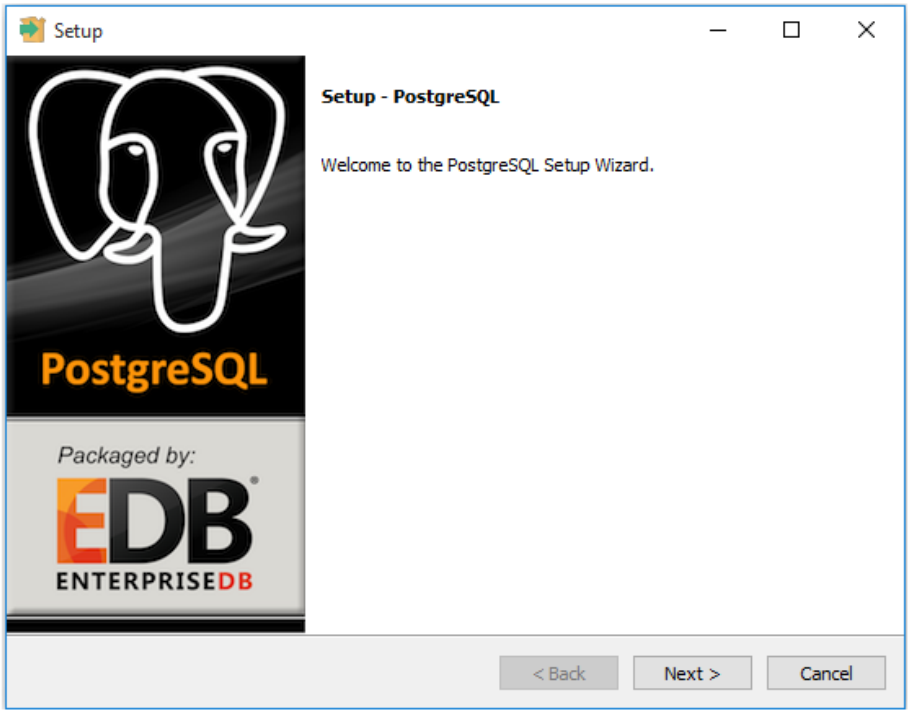
1. Go to the following link: Node.js link

2. download the desired version preferably the recommended one. See picture below

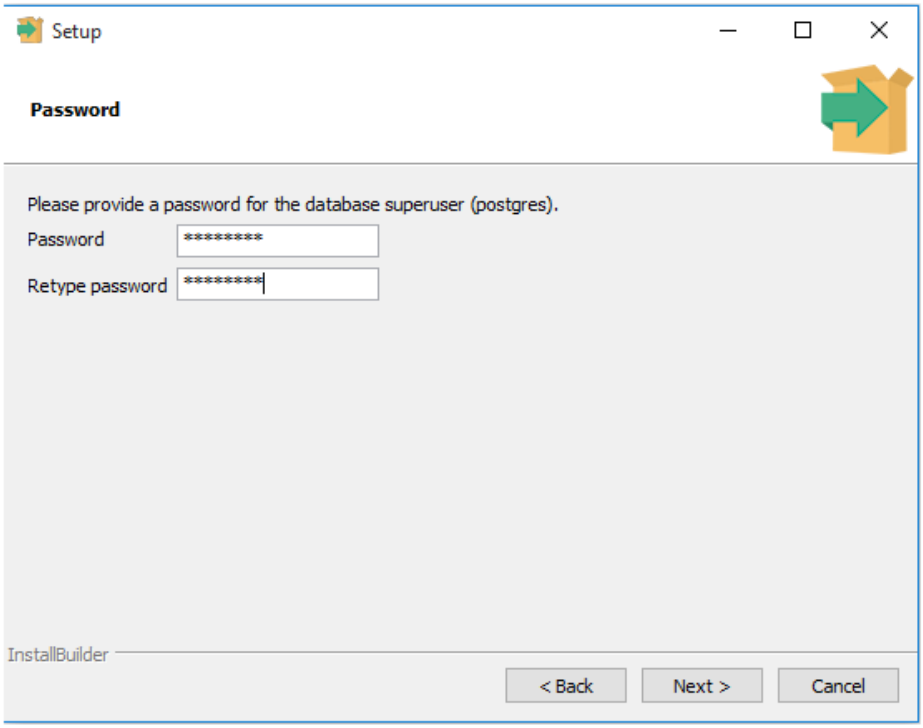
3. run the downloaded .exe file and follow the prompts to install it

6.1.6 Installing PostgreSQL

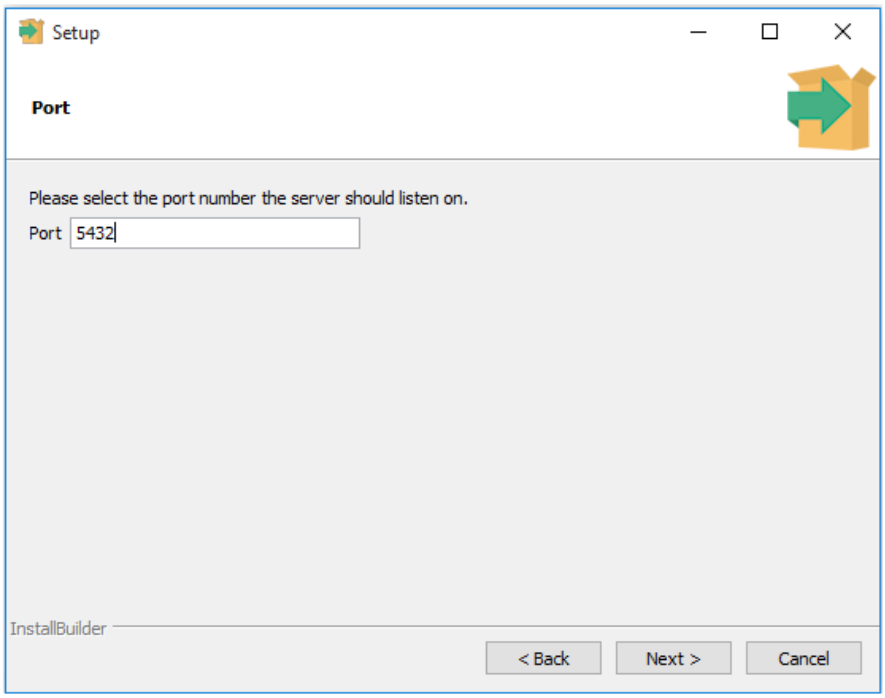
1. You need to download the installer from PostgreSQL Official website.
2. Go to the PostgreSQL official website, download section for Windows PostgreSQL Link.
3. Click on the download installer from EnterpriseDB
4. Choose the latest version to download. It takes few minutes to complete the download.
5. Double click the installer



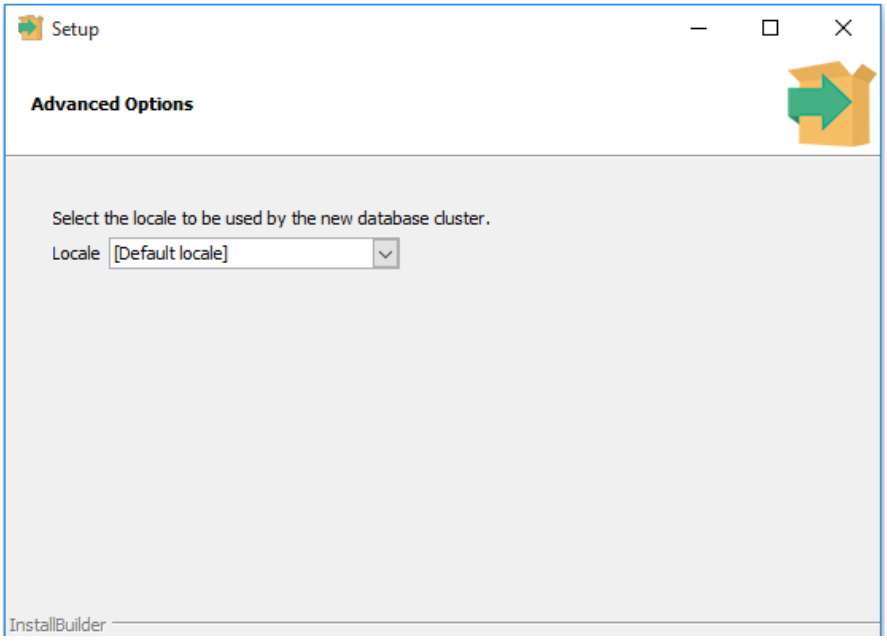
6. Enter the password for the database superuser and service account.



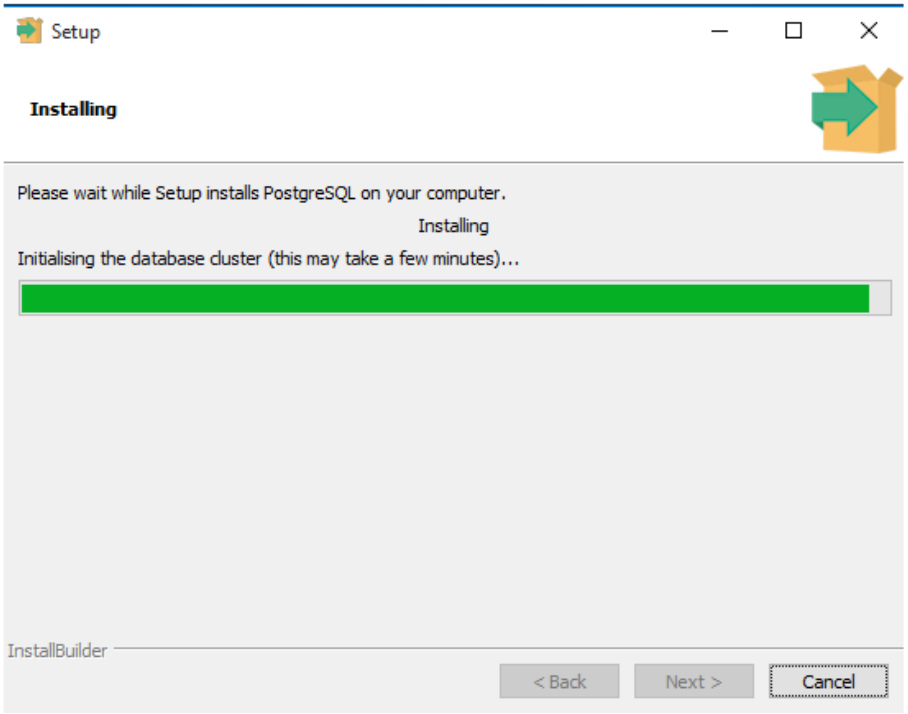
7. Enter the port for PostgreSQL. Make sure that no other applications are using this port. Leave it as default if you are unsure



8. Choose the default locale used by the database.



9. Wait for it to finish installing



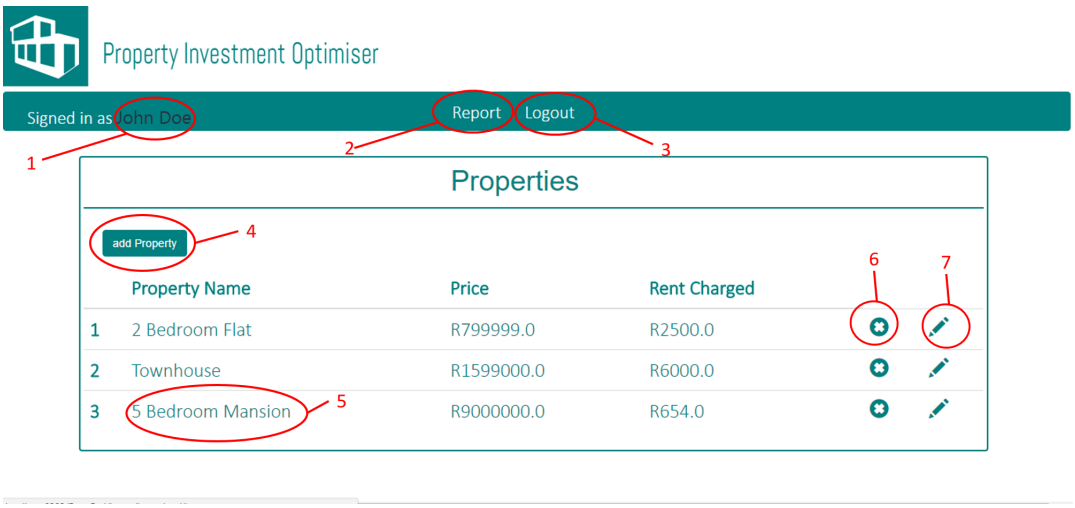
10. Click finish

6.2 Setting up the System

Open Netbeans and open the 'BackEndPIO' netbeans project from the project folder. Once opened, run the project in order to start the Glassfish serve. BackEndPIO runs on port 8080.
Once 'BackEndPIO' is running, open the 'FrontEnd' netbeans project from the project folder. Once opened, run the project. 'FrontEnd' runs on port 8383.

7 Using The System

7.1 Home Page



Once the user has successfully logged into the system, the user will see this page. This page facilitates the following functionalities:

1. **Profile**

   When the user clicks their name, the system will navigate to the profile page that will display their personal details. The user can change his/her details accordingly. They will also be able to see the number of properties associated with their profile.

2. **Report**

   This functionality will enable the user to generate a report about certain properties in a pdf file. Based on several calculations configured for certain properties, the report will contain the calculation results and display the Return of Interest based on the calculations.

3. **Logout**

   This button will log the user out of the system. Once this option has been selected, the user will not be able to use the system. They will be redirected to the "main

page" where they will need to log in again should they want to use the system again.

4. **Add Property**

   This button will enable the user to add more details about a certain property. This information will be persisted and certain values will be calculated by the system dynamically as the user adds a certain property.

5. **View Property Details**

   When the user clicks on one of the entries on the table, he/she will be redirected to a page that shows more information about the property they have selected.

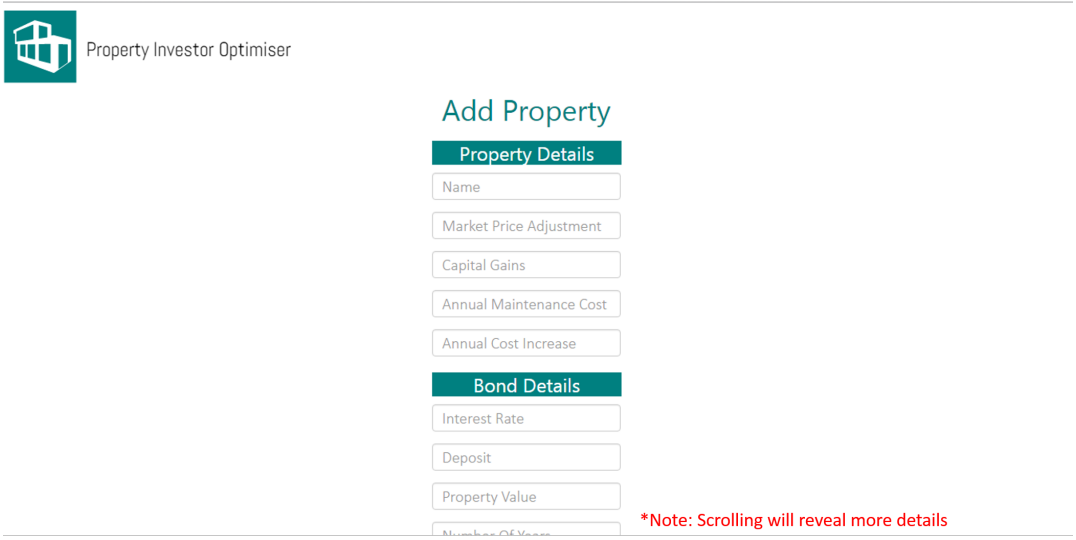
6. **Delete Property**

   This button will delete the relevant property from the database. The page will reload and show the updated list.

7. **Update Property Details**

   This button will allow the user to change the details for a property that has already been added to the list.

7.2 Add Property



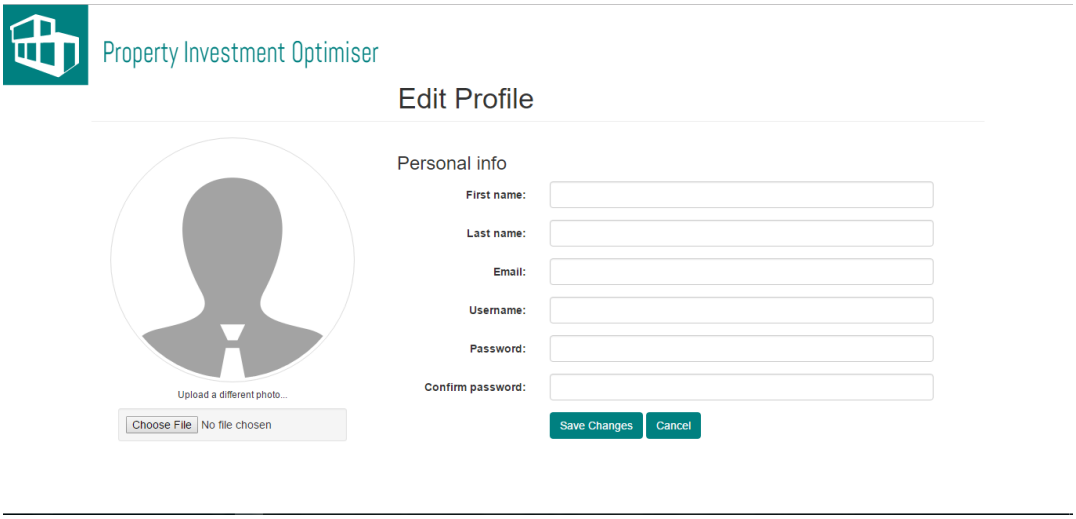
Add Property As previously mentioned on the fifth point under the "home page" section, this page will enable the user to add a property to the system. Once validated, the details will then be added onto the system. The user needs to add a certain property once. Certain property details can be edited.

7.3 Property Details

Property Details As previously mentioned on the fifth point under the "home page" section, this page will enable the user see more details about the property they have selected on the "home page". The "ROI In Years" graph will be generated and more information pertaining to the property will be displayed.

1. This button will enable the user to get back to the "home page".

7.4 Profile



Profile This page will allow the user to change their login details and also to add extra details if they wish, like their full names and a profile picture.