



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

---

COS 301

DEPARTMENT OF COMPUTER SCIENCE

---

## User Manual

---

*Group Members:*

*Student numbers:*

Diana Obo

u13134885

Priscilla Madigoe

u13049128

Kudzai Muranga

u13278012

Sandile Khumalo

u12031748

July 29, 2016

# IMPAKD LINK

For further references see [gitHub](#). July 29, 2016

# Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>Vision</b>	<b>3</b>
<b>3</b>	<b>Background</b>	<b>3</b>
<b>4</b>	<b>System Overview</b>	<b>4</b>
<b>5</b>	<b>Installation</b>	<b>4</b>
5.1	Prerequisites . . . . .	4
5.1.1	Installing Apache Maven . . . . .	5
5.1.2	Installing Glassfish Server . . . . .	8
5.1.3	Installing Java JDK . . . . .	9
5.1.4	Installing Netbeans . . . . .	10
5.1.5	Installing Node.js . . . . .	10
5.1.6	Installing PostgreSQL . . . . .	11
5.2	Setting up the System . . . . .	15
<b>6</b>	<b>Using The System</b>	<b>15</b>
6.1	Home Page . . . . .	15
6.2	Add Property . . . . .	16
6.3	Property Details . . . . .	16

# 1 Introduction

This document is a user manual for a Property Investor 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 Investor 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?

## 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 Investor 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.

## 5 Installation

### 5.1 Prerequisites

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

- AngularJS - <https://angularjs.org/>
- Apache Maven - <https://maven.apache.org/download.cgi>
- Glassfish Server - <https://glassfish.java.net/download.html>
- Java JDK - <http://www.oracle.com/technetwork/java/javase/downloads/index.html>
- Netbeans - <https://netbeans.org/downloads/>
- Node.js - <https://nodejs.org/en/download/>
- PostgreSQL - <https://www.postgresql.org/download/>

You must first download the project from the following link: <https://github.com/u13278012/IMPAKD>. After you have downloaded the project, follow the instructions below to install the required technology.

## 5.1.1 Installing Apache Maven

1. Go to the following link: <https://maven.apache.org/download.cgi>

The screenshot shows the Apache Maven Project download page for version 3.3.9. The page has a header with the Apache Maven Project logo and the URL <http://maven.apache.org/>. The main content area is titled "Downloading Apache Maven 3.3.9". It states that Apache Maven 3.3.9 is the latest release and recommended version for all users. It also mentions that the currently selected download mirror is <http://apache.saix.net/> and provides a link to the [complete list of mirrors](#). There is a dropdown menu for "Other mirrors" with the value "http://apache.is.co.za/" and a "Change" button. Below this is a "System Requirements" section with a table:

<b>Java Development Kit (JDK)</b>	Maven 3.3 requires JDK 1.7 or above to execute - it still allows you to build against 1.3 and other JDK versions <a href="#">by Using Toolchains</a>
<b>Memory</b>	No minimum requirement
<b>Disk</b>	Approximately 10MB is required for the Maven installation itself. In addition to that, additional disk space will be used for your local Maven repository. The size of your local repository will vary depending on usage but expect at least 500MB.
<b>Operating</b>	No minimum requirement. Start up scripts are included as shell scripts and Windows batch files.

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

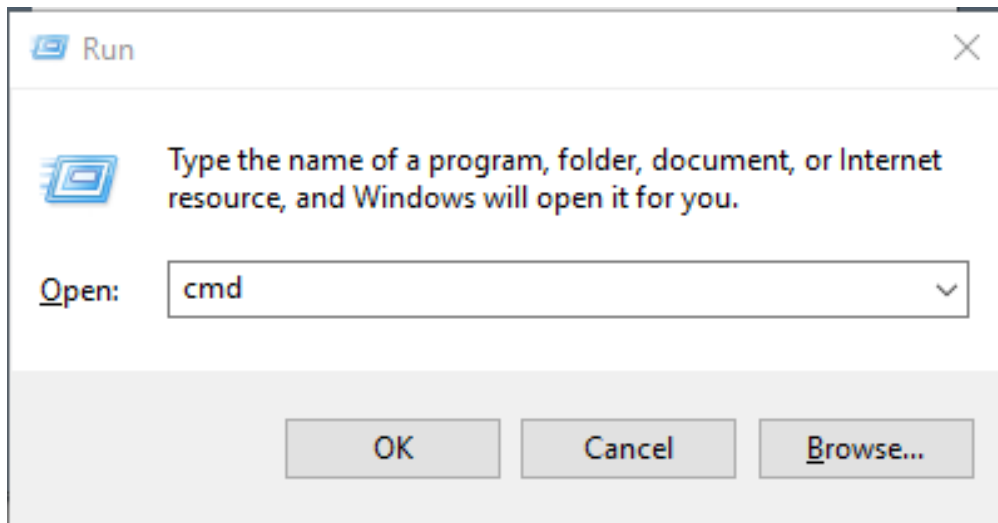
The screenshot shows the "Files" section of the Apache Maven Project download page. It contains a table with download links, checksums, and signatures for various Maven distributions. The table has four columns: "Link", "Checksum", and "Signature". The rows are:

Binary tar.gz archive	<a href="#">apache-maven-3.3.9-bin.tar.gz</a>	<a href="#">apache-maven-3.3.9-bin.tar.gz.md5</a>	<a href="#">apache-maven-3.3.9-bin.tar.gz.asc</a>
Binary zip archive	<a href="#">apache-maven-3.3.9-bin.zip</a>	<a href="#">apache-maven-3.3.9-bin.zip.md5</a>	<a href="#">apache-maven-3.3.9-bin.zip.asc</a>
Source tar.gz archive	<a href="#">apache-maven-3.3.9-src.tar.gz</a>	<a href="#">apache-maven-3.3.9-src.tar.gz.md5</a>	<a href="#">apache-maven-3.3.9-src.tar.gz.asc</a>
Source zip archive	<a href="#">apache-maven-3.3.9-src.zip</a>	<a href="#">apache-maven-3.3.9-src.zip.md5</a>	<a href="#">apache-maven-3.3.9-src.zip.asc</a>

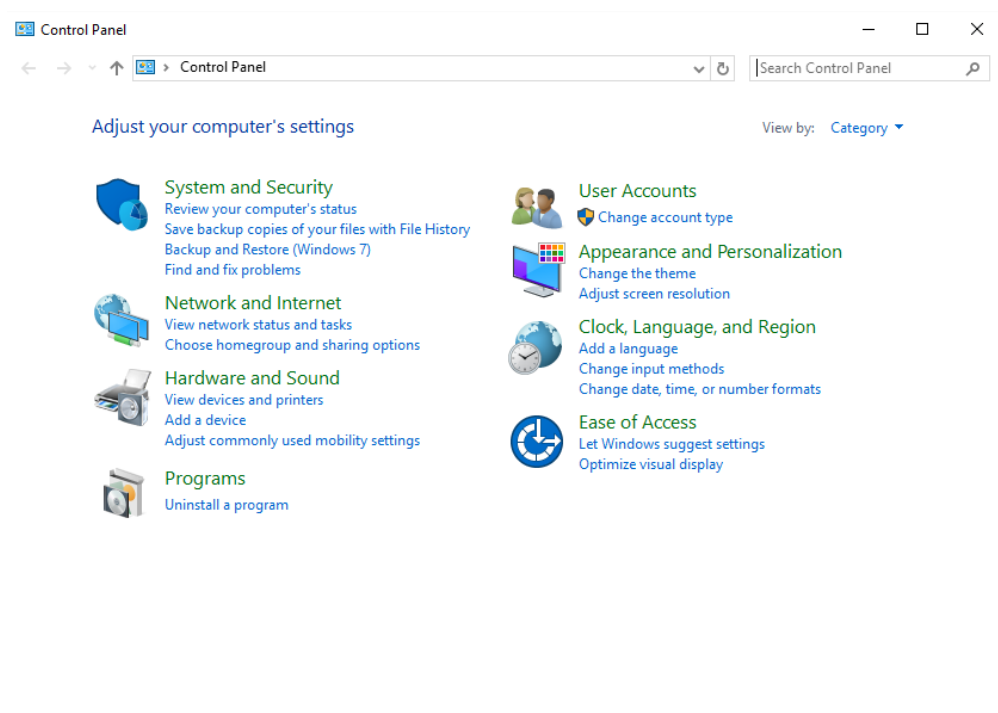
Below the table, there is a list of links for "Release Notes", "Reference Documentation", "Apache Maven Website As Documentation Archive", and "All sources (plugins, shared libraries...) available at <https://www.apache.org/dist/maven/>". It also mentions that the distributions are "Distributed under the Apache License, version 2.0".

The "Previous Releases" section is also visible, stating that it is strongly recommended to use the latest release version of Apache Maven to take advantage of newest features and bug fixes. It also mentions that if you still want to use an old version you can find more information in the [Maven Releases History](#) and can download files from the [archives](#) for versions 3.0.4+ and legacy archives for earlier releases.

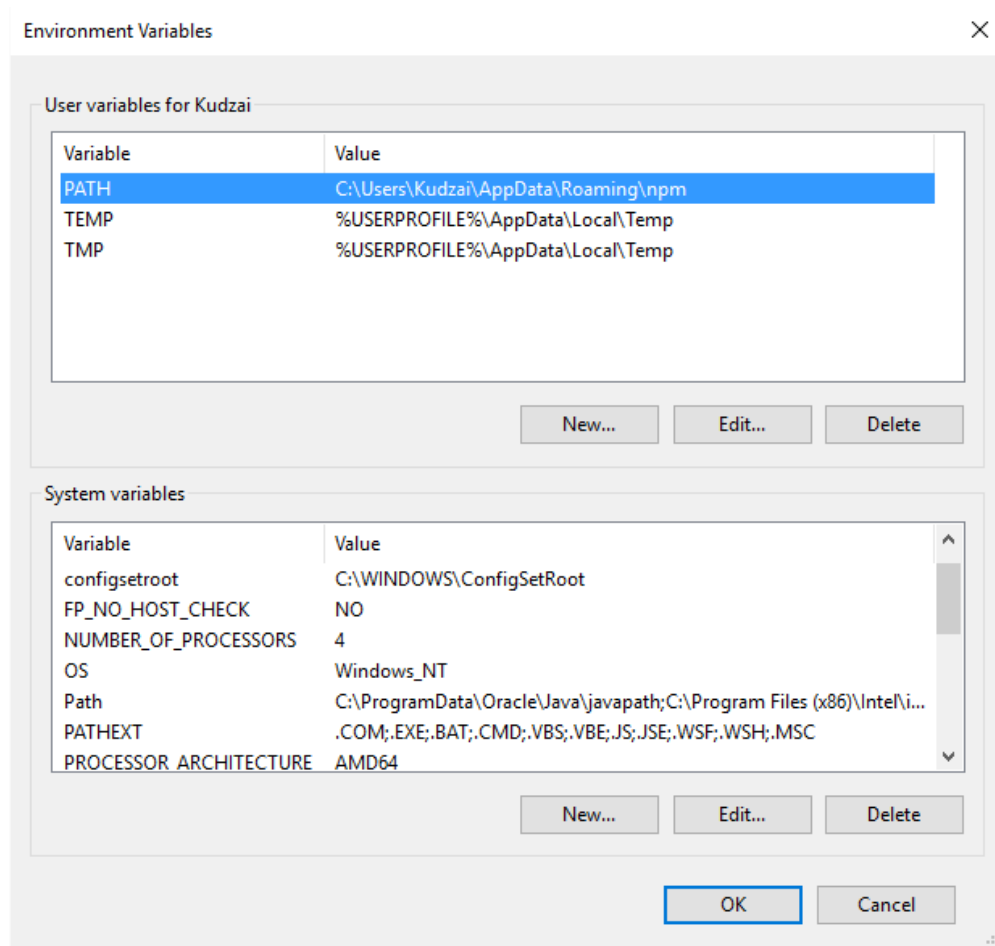
3. Open the command prompt by pressing the windows key together with the letter 'r', win+R, and type 'cmd'.



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

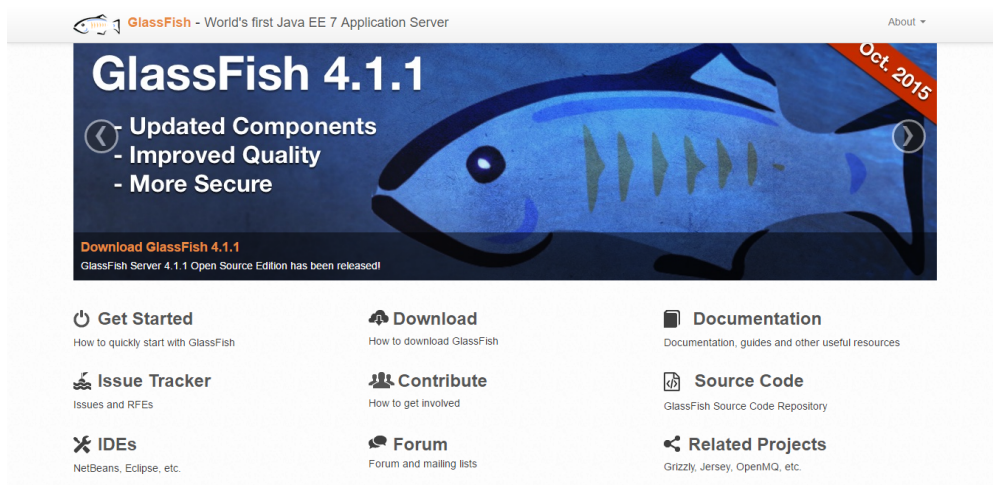


11. Add the file directory path of the 'bin' folder for Apache Maven and click OK.

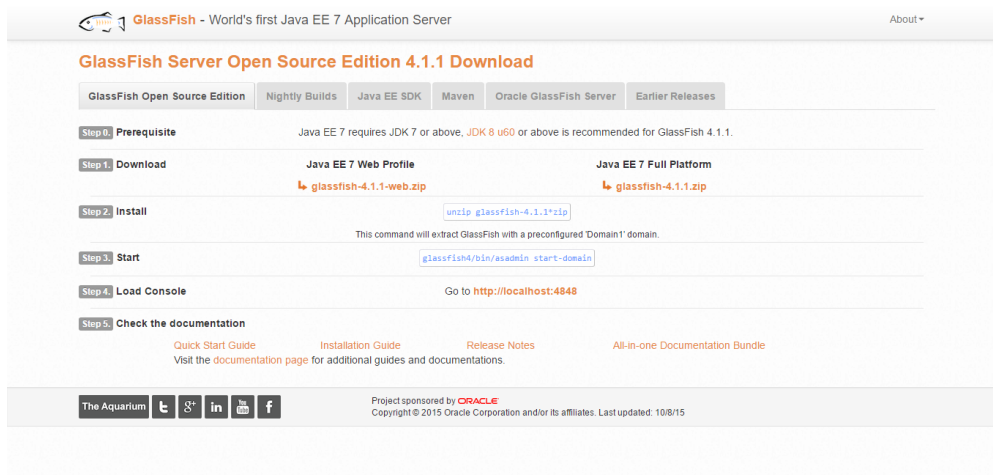


## 5.1.2 Installing Glassfish Server

1. Go to the following link: <https://glassfish.java.net/download.html>



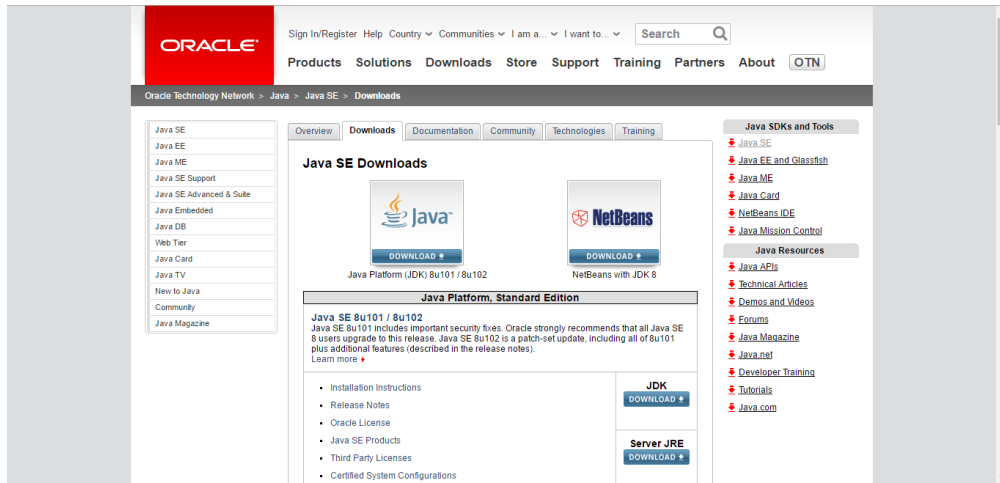
2. Click the Download link



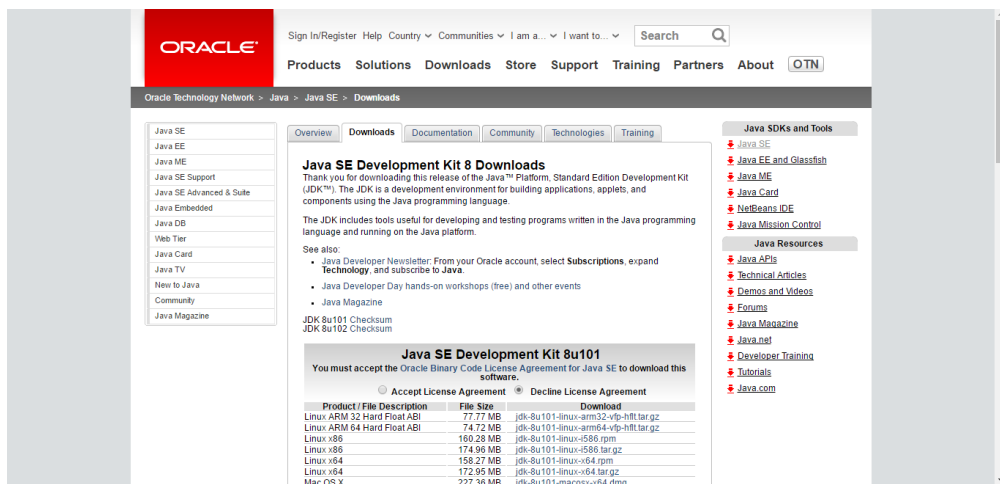
3. Download the 'Java EE 7 Full Platform' link and follow the instructions on the page.

### 5.1.3 Installing Java JDK

1. Go to the following link: <http://www.oracle.com/technetwork/java/javase/downloads/index.html>



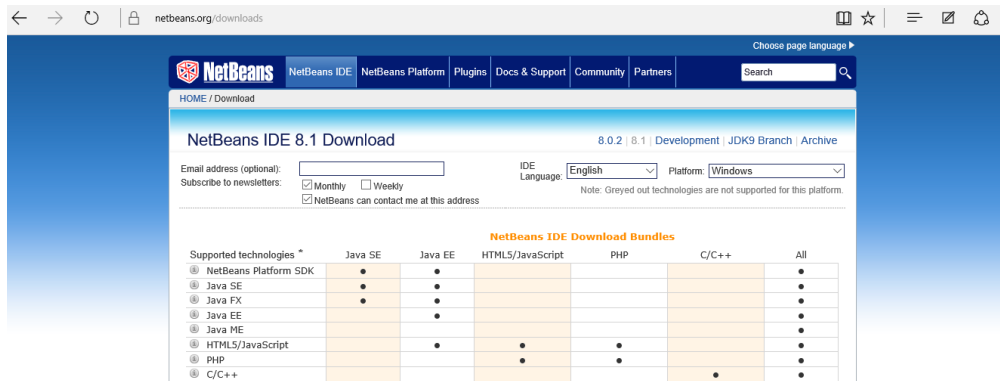
2. Click on the 'Java Platform (JDK) 8u101 / 8u102' link.



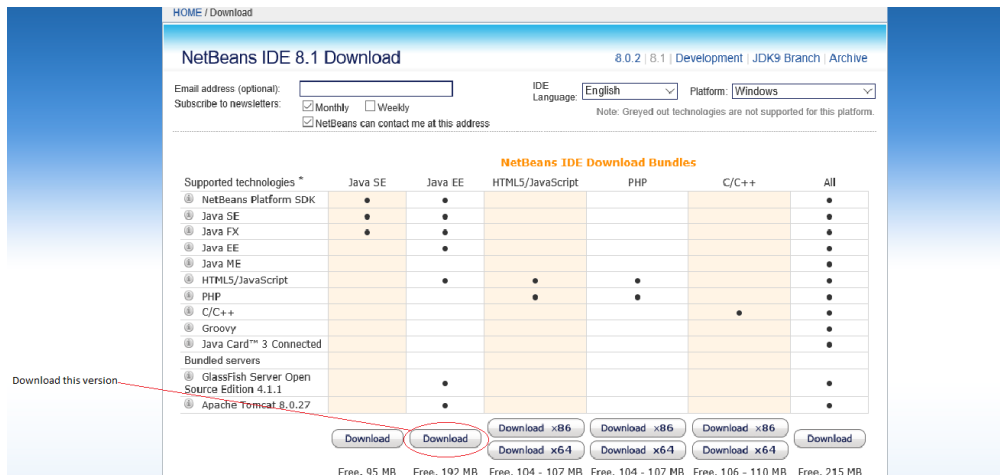
3. Select your required version and download it.
4. Once downloaded, open the installation file and follow the prompts to install it.

## 5.1.4 Installing Netbeans

1. Go to the following link: [Netbeans link](#)



2. download this version



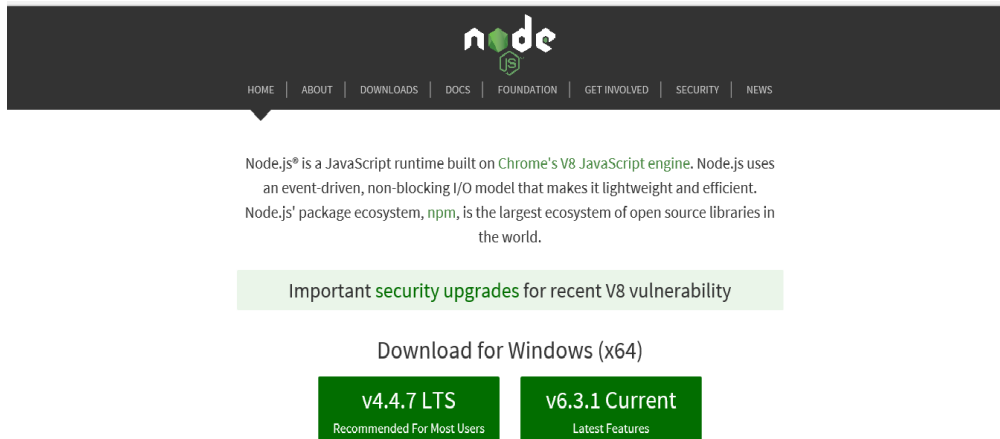
3. run the downloaded .exe file and follow the prompts to install it

## 5.1.5 Installing Node.js

1. Go to the following link: [Node.js link](#)



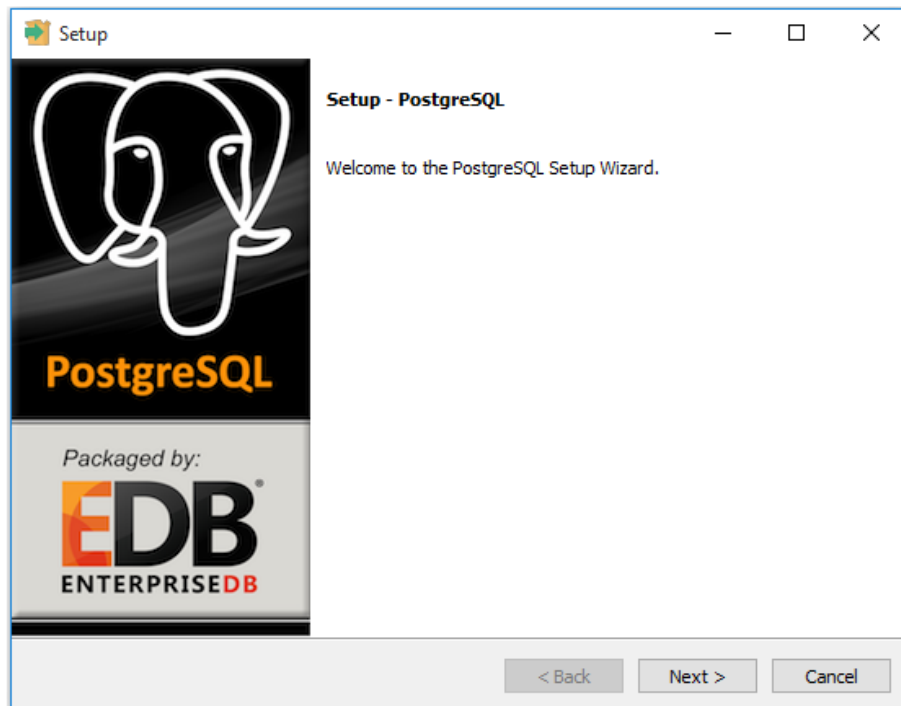
2. download the desired version preferably the recommended one. See picture below



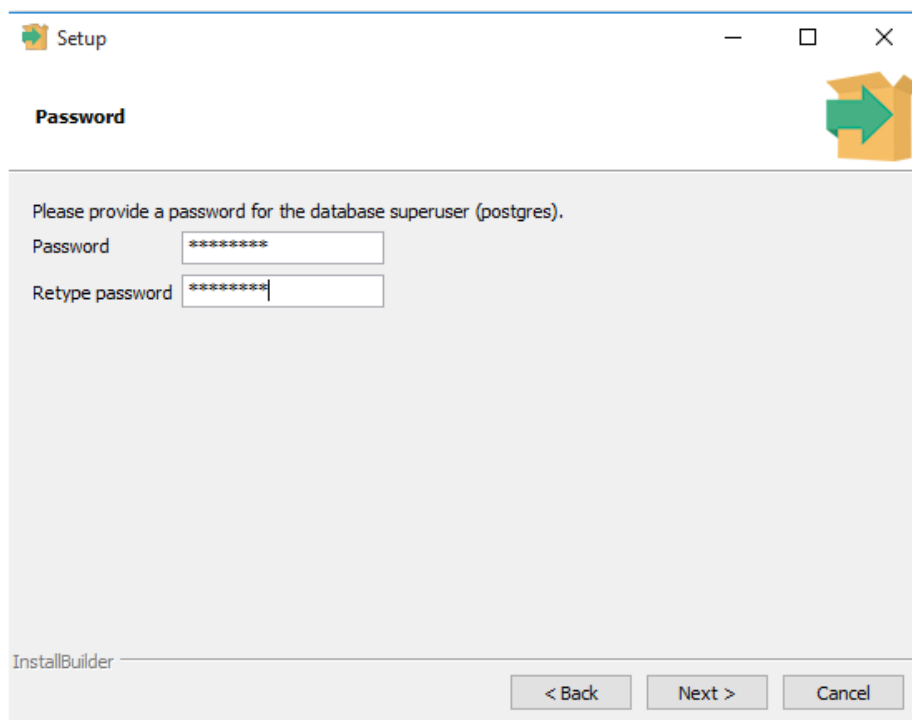
3. run the downloaded .exe file and follow the prompts to install it

### 5.1.6 Installing PostgreSQL

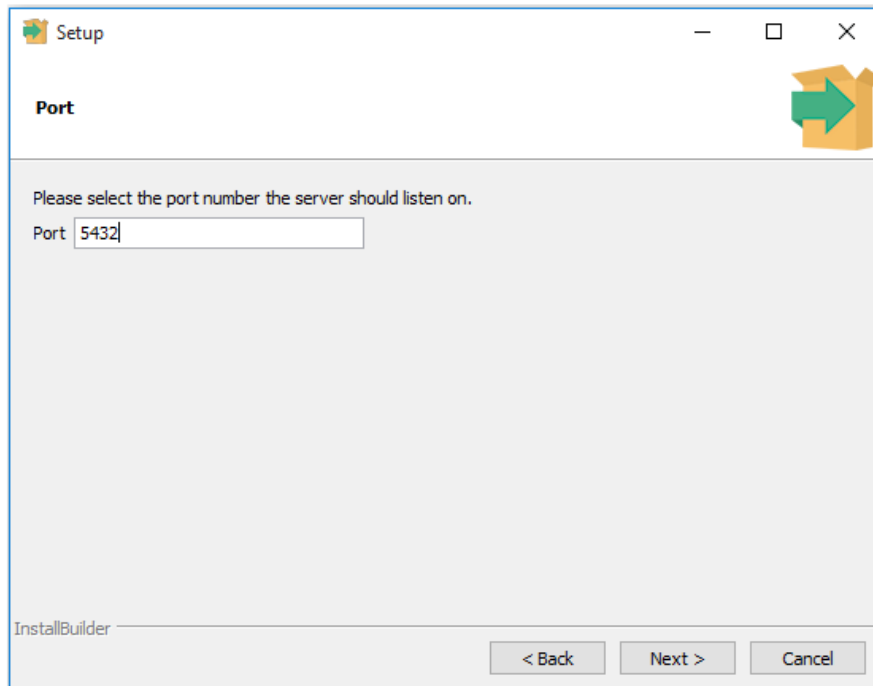
1. You need to download the installer from PostgreSQL Official website.
2. Go to the PostgreSQL official website, download section for Windows [PostgreSQL Link](#).
3. Click on the download installer from EnterpriseDB
4. Choose the latest version to download. It takes few minutes to complete the download.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



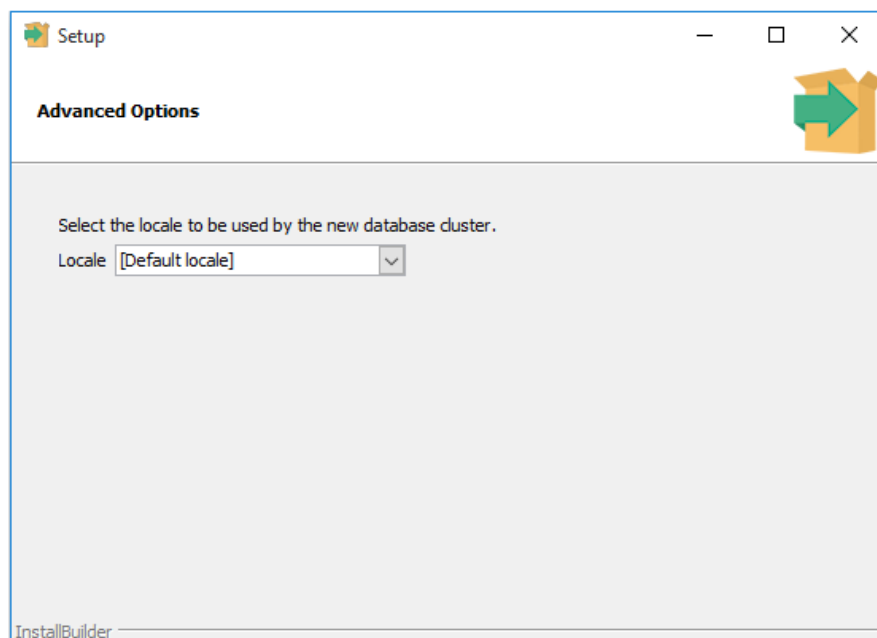
6. Enter the password for the database superuser and service account.



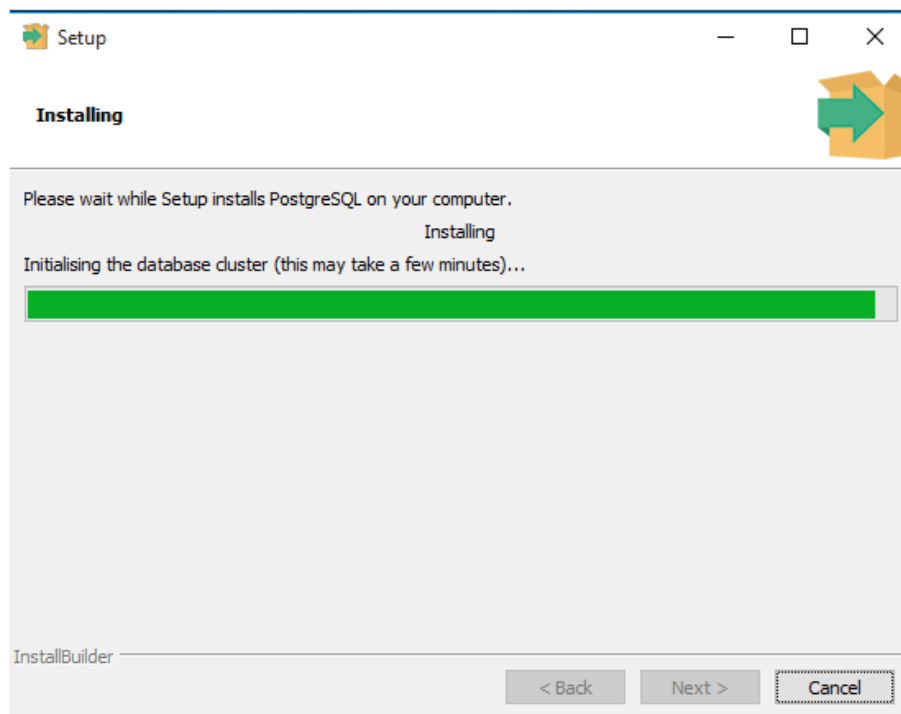
7. Enter the port for PostgreSQL. Make sure that no other applications are using this port. Leave it as default if you are unsure



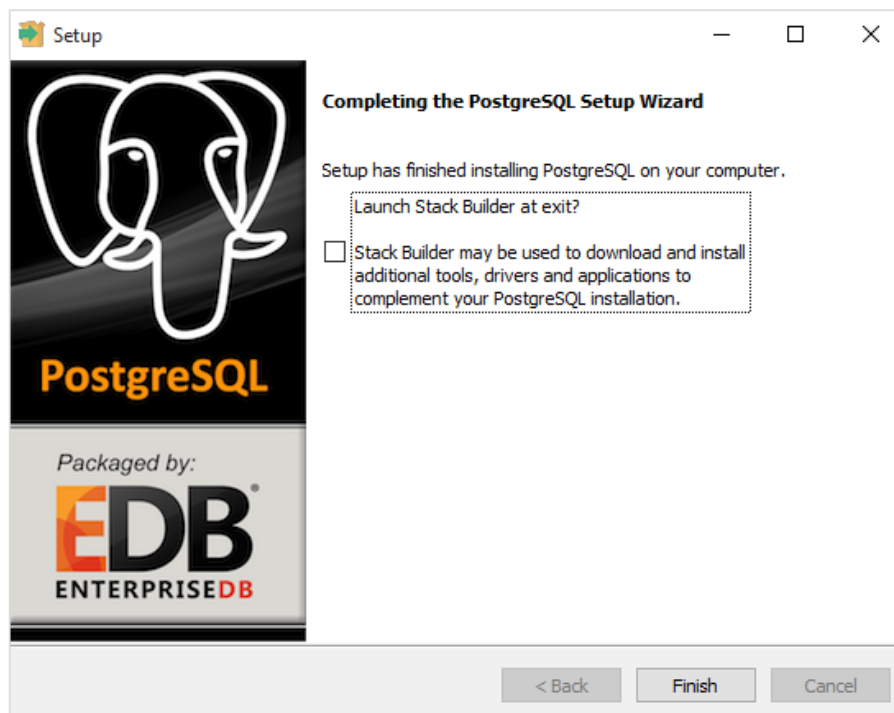
8. Choose the default locale used by the database.



9. Wait for it to finish installing



10. Click finish



## 5.2 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.

# 6 Using The System

## 6.1 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. 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.




## **6.2 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.

## **6.3 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".

Property Investor Optimiser

Signed in as Jane DoeReportLogout

1

2

3

4


5

### Properties

add Property

#	Property Name	Price	ROI
1	3 Bedroom House	1 995 000	15%
2	1.5 Bedroom Apartment	R 330 000	5%
3	3 Bedroom Townhouse	R 1 250 000	20%

Figure 1: Home Page

Property Investor Optimiser

### Add Property

Property Details

Market Price Adjustment

Capital Gains

Annual Maintenance Cost

Annual Cost Increase

Bond Details

Interest Rate

Deposit

Property Value

Number Of Years

\*Note: Scrolling will reveal more details

Figure 2: Add Property



### Property Details

[< Back](#)

#### Property

Property name	City Properties
Tax	21%
Inflation	5.5%
Annual maintenance cost	6000.00
Annual cost increase	10%

#### Bond

Interest Rate	10%
Deposit as percentage	21%
Property value	R500000.00
Number of years	30

#### Rental

Occupancy Rate	11%
Agent Commission	R 17000.00
Rental Amount	5000.00

1

ROI IN YEARS

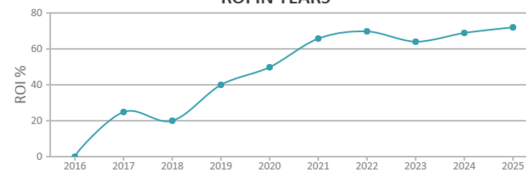


Figure 3: Property Details