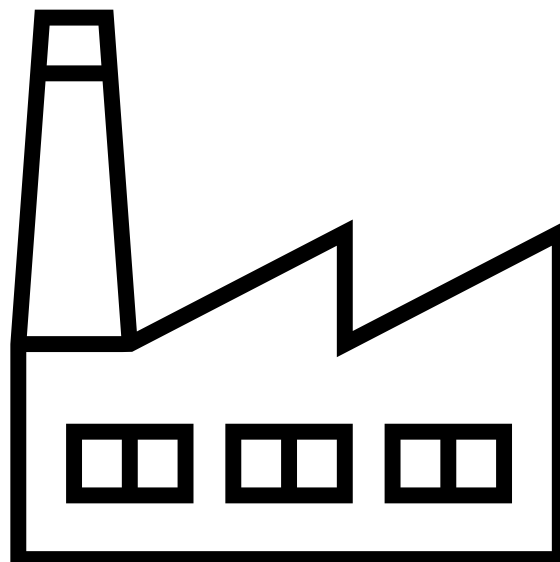


Summative Assessment 4

18-23 July 2024

Jamie Myburgh



Implementation
Question 5

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a) Compliance with User Expectations

Needs and Expectations of Program

A meeting with an UrbanFurn representative was commenced regarding the program, to ensure that the specifications and requirements of the program have been met. The UrbanFurn representative was given a walkthrough of the program, as well as a walkthrough of the code.


A quick run-through of how to use the program was also done, in which the representative tested the program for themselves, by inputting their own values and information into the system to observe its functionality and the accuracy of the calculations.

After further discussions regarding maintenance and updating of information in the future, it was then concluded that the company was satisfied with the program, that there were no other additions to the program, and that no other aspects were to be changed.

Test Cases

A series of test cases were developed to cover all possible user scenarios and their expected outcomes. There are approximately 10 possible outcomes that can occur through user input, and comprehensive test cases were developed for this.

Shift 1: Regular Hours



```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----


Please enter the hours you've worked for the week:
40

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
1

Hours: 40
Shift: 1st
Rate: R50 per hour

Regular Pay: R2000.0
Net: R2000.0
BUILD SUCCESSFUL (total time: 7 seconds)
```

Shift 1: Overtime



```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
50

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
1

Hours: 50
Shift: 1st
Rate: R50 per hour

Regular pay: R2000.0
Overtime: 10 hours.
Overtime pay: R750.0
Total: R2750.0
Net: R2750.0
```

Shift 2: Regular Hours with Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
40

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
2

Would you like to apply for a retirement fund? (yes/no)
yes

Hours: 40
Shift: 2nd
Rate: R70 per hour

Regular Pay: R2800.0
Retirement deduction: R140.0
Net: R2660.0
BUILD SUCCESSFUL (total time: 4 seconds)
```

Shift 2: Regular Hours without Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
40

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
2

Would you like to apply for a retirement fund? (yes/no)
no

Hours: 40
Shift: 2nd
Rate: R70 per hour

Regular Pay: R2800.0
Net: R2800.0
BUILD SUCCESSFUL (total time: 3 seconds)
```

Shift 2: Overtime with Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
50

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
2

Would you like to apply for a retirement fund? (yes/no)
yes

Hours: 50
Shift: 2nd
Rate: R70 per hour

Regular pay: R2800.0
Overtime: 10 hours.
Overtime pay: R1050.0
Total: R3850.0
Retirement deduction: R192.5
Net: R3657.5
BUILD SUCCESSFUL (total time: 7 seconds)
```

Shift 2: Overtime without Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
50

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
2

Would you like to apply for a retirement fund? (yes/no)
no

Hours: 50
Shift: 2nd
Rate: R70 per hour

Regular pay: R2800.0
Overtime: 10 hours.
Overtime pay: R1050.0
Total: R3850.0
Net: R3850.0
BUILD SUCCESSFUL (total time: 5 seconds)
```

Shift 3: Regular Hours with Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
40

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
3

Would you like to apply for a retirement fund? (yes/no)
yes

Hours: 40
Shift: 3rd
Rate: R90 per hour

Regular Pay: R3600.0
Retirement deduction: R180.0
Net: R3420.0
BUILD SUCCESSFUL (total time: 4 seconds)
```

Shift 3: Regular Hours without Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
40

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
3

Would you like to apply for a retirement fund? (yes/no)
no

Hours: 40
Shift: 3rd
Rate: R90 per hour

Regular Pay: R3600.0
Net: R3600.0
BUILD SUCCESSFUL (total time: 4 seconds)
```


Shift 3: Overtime with Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
50

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
3

Would you like to apply for a retirement fund? (yes/no)
yes

Hours: 50
Shift: 3rd
Rate: R90 per hour

Regular pay: R3600.0
Overtime: 10 hours.
Overtime pay: R1350.0
Total: R4950.0
Retirement deduction: R247.5
Net: R4702.5
BUILD SUCCESSFUL (total time: 4 seconds)
```

Shift 3: Overtime without Retirement

```
run:
Welcome to the UrbanFurn Payroll Calculator!
-----

Please enter the hours you've worked for the week:
50

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
3

Would you like to apply for a retirement fund? (yes/no)
no

Hours: 50
Shift: 3rd
Rate: R90 per hour

Regular pay: R3600.0
Overtime: 10 hours.
Overtime pay: R1350.0
Total: R4950.0
Net: R4950.0
BUILD SUCCESSFUL (total time: 7 seconds)
```

b) User Manual

Below is a clear and concise user manual and installation guide describing the steps to use the program. These manuals can be used by the company or the employees within the company.

Installation Guide:

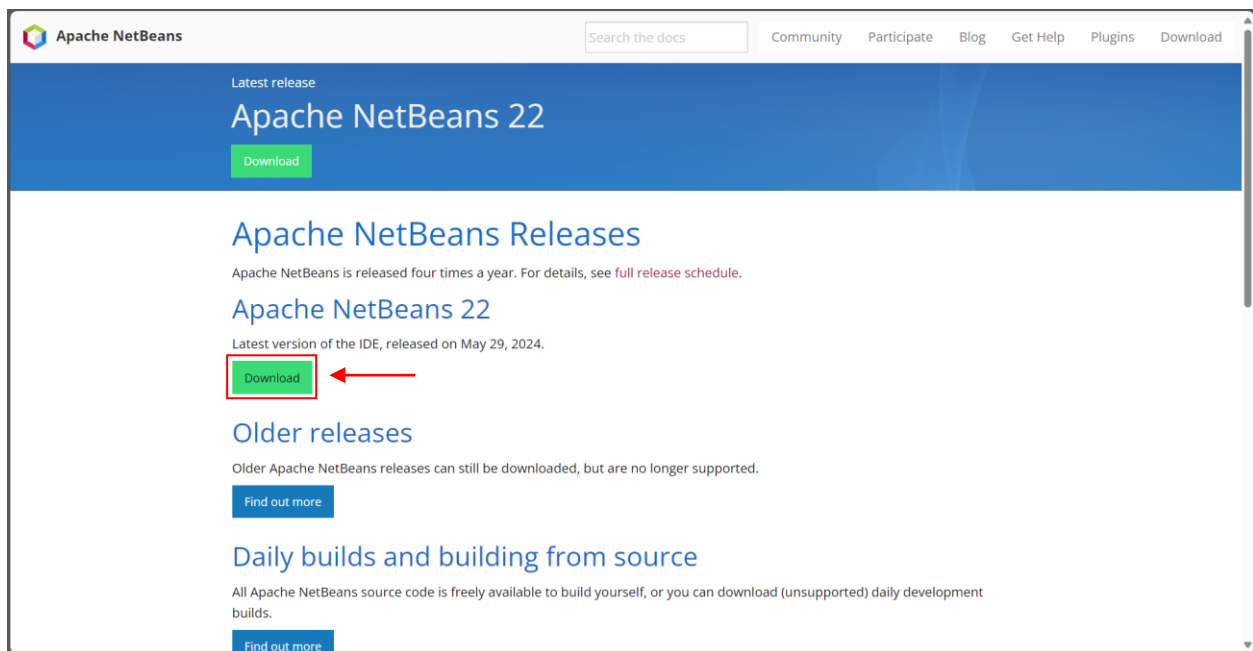
Step 1:

Download the Apache NetBeans IDE from the following link:

<https://netbeans.apache.org/front/main/download/>

Step 2:

You will be directed to the following page. Click the green button labelled “Download”.



Please note the date of the Apache NetBeans release. As of the 17th of July 2024, this version of NetBeans is the latest release. Once the IDE has been downloaded, it is not necessary to redownload the latest releases – they can simply be updated straight from the IDE.

Step 3:

You will be directed to the page displayed below. Click on the first link under “Installers”.

Apache NetBeans

Search the docs

Community Participate Blog Get Help Plugins Download

Downloading Apache NetBeans 22

Apache NetBeans 22 was released on May 29, 2024.

Apache NetBeans 22 is available for download from your closest Apache mirror.

Binaries (Platform Independent):

- [netbeans-22-bin.zip \(SHA-512, PGP ASC\)](#)

Installers and Packages:

- [Apache-NetBeans-22-bin-windows-x64.exe \(SHA-512, PGP ASC\)](#)
- [Apache-NetBeans-22.pkg \(SHA-512, PGP ASC\)](#)
- [apache-netbeans_22-1_all.deb \(SHA-512, PGP ASC\)](#)
- [apache-netbeans-22-0.noarch.rpm \(SHA-512, PGP ASC\)](#)
- [Linux snap package](#)

Source:

- [netbeans-22-source.zip \(SHA-512, PGP ASC\)](#)

Officially, it is important that you [verify the integrity](#) of the downloaded files using the PGP signatures (.asc file) or a hash (.sha512 files). The PGP keys used to sign this release are available [here](#).

Release Notes:

- [Github Link](#)

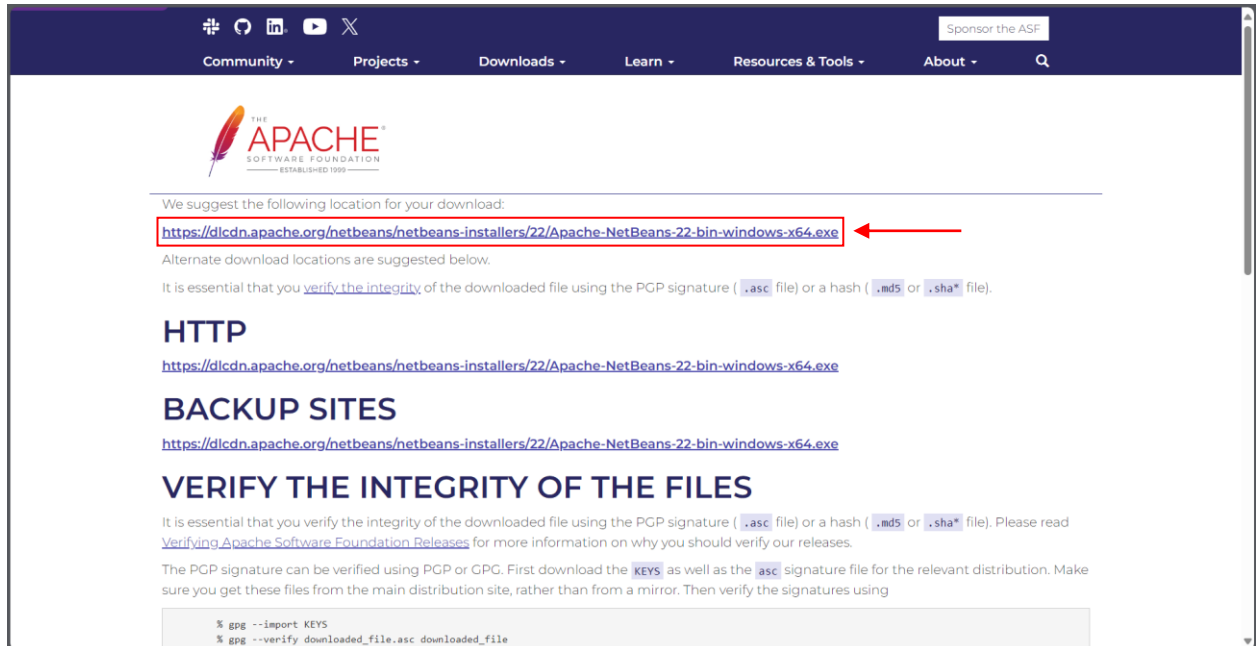
Community Installers

- [Codelerity / Gj IT packages](#) - Windows, macOS and Linux (.deb / .rpm / .ApplImage) built with NBPackage. Most include a local JDK runtime for the IDE to run on, for a self-contained out-of-the-box experience.

Community Installers
Deployment Platforms
Known Issues
Building from Source
Community Approval
Earlier Releases

Step 4:

The following page will open. Click on the first link.

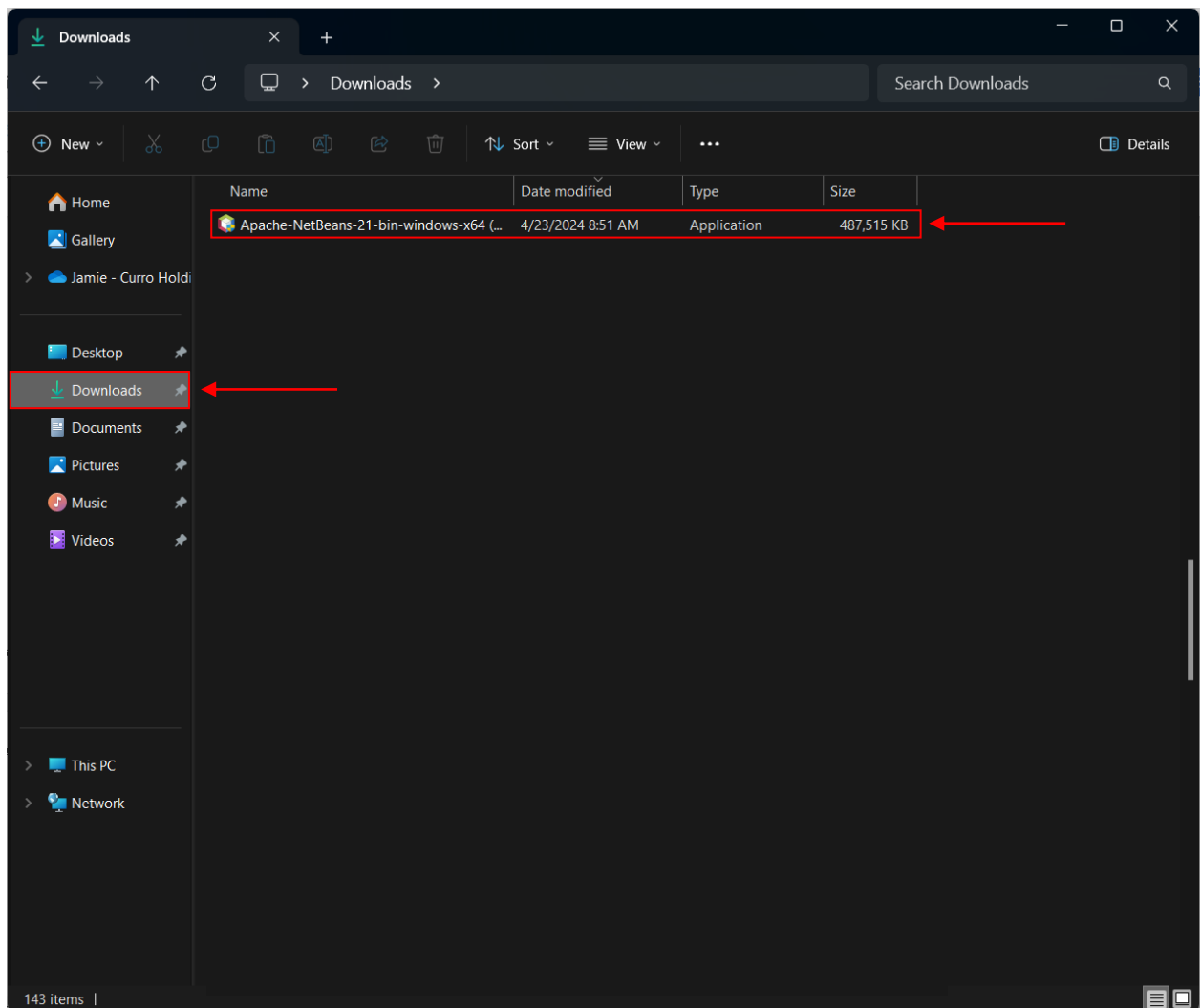


The screenshot shows the Apache Software Foundation's download page for NetBeans. The page has a dark blue header with navigation links: Community, Projects, Downloads, Learn, Resources & Tools, and About. A search icon is also present. Below the header is the Apache logo and the text "ESTABLISHED 1999". The main content area has a white background. It starts with a heading "We suggest the following location for your download:" followed by a red-bordered link: <https://dlcdn.apache.org/netbeans/netbeans-installers/22/Apache-NetBeans-22-bin-windows-x64.exe>. A red arrow points to this link. Below this is the text "Alternate download locations are suggested below." and a paragraph about verifying the integrity of the downloaded file using PGP signatures or hashes. The page is divided into sections: "HTTP" with a link to the same download location, "BACKUP SITES" with another link to the same location, and "VERIFY THE INTEGRITY OF THE FILES" with instructions on how to verify the file's integrity using GPG. At the bottom, there is a code block with the following commands:

```
% gpg --import KEYS
% gpg --verify downloaded_file.asc downloaded_file
```

Step 5:

The download will be available in the location in which you saved it. This location will most likely be your “Downloads” folder in your files explorer.



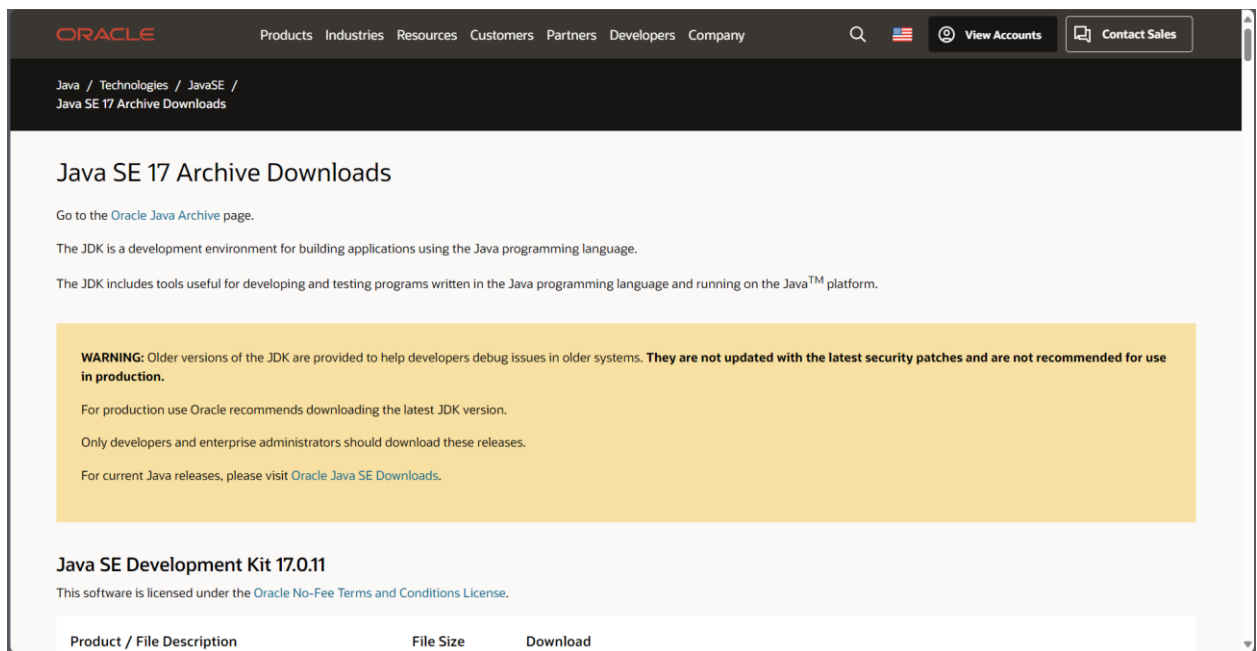
Step 6:

Before opening your Apache Netbeans IDE, it is recommended that you first download the Java extension. The extension can be downloaded from the following link:

<https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html>

Step 7:

The following page will display:

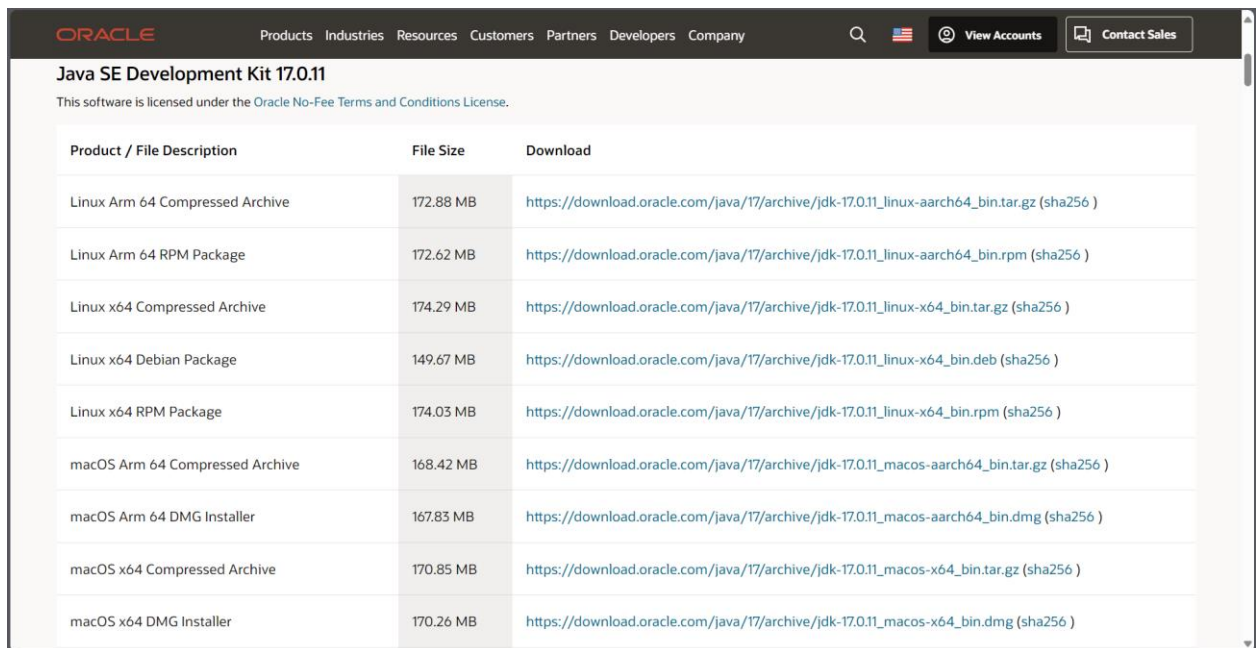


The screenshot shows the Oracle website's 'Java SE 17 Archive Downloads' page. The page has a dark header with the Oracle logo and navigation links. Below the header, the breadcrumb trail reads 'Java / Technologies / JavaSE / Java SE 17 Archive Downloads'. The main heading is 'Java SE 17 Archive Downloads'. Below this, there is a link to the 'Oracle Java Archive page'. A paragraph explains that the JDK is a development environment for building applications using the Java programming language. Another paragraph states that the JDK includes tools useful for developing and testing programs written in the Java programming language and running on the Java™ platform. A yellow warning box contains the text: 'WARNING: Older versions of the JDK are provided to help developers debug issues in older systems. They are not updated with the latest security patches and are not recommended for use in production.' Below the warning box, there are three lines of text: 'For production use Oracle recommends downloading the latest JDK version.', 'Only developers and enterprise administrators should download these releases.', and 'For current Java releases, please visit Oracle Java SE Downloads.' Below the warning box, the heading 'Java SE Development Kit 17.0.11' is displayed, followed by a link to the 'Oracle No-Fee Terms and Conditions License'. At the bottom, there is a table with three columns: 'Product / File Description', 'File Size', and 'Download'.

Product / File Description	File Size	Download
----------------------------	-----------	----------

Step 8:

Use your mouse or mousepad to scroll down. There will be a list of downloadable links to install the JDK.



Product / File Description	File Size	Download
Linux Arm 64 Compressed Archive	172.88 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_linux-aarch64_bin.tar.gz (sha256)
Linux Arm 64 RPM Package	172.62 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_linux-aarch64_bin.rpm (sha256)
Linux x64 Compressed Archive	174.29 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_linux-x64_bin.tar.gz (sha256)
Linux x64 Debian Package	149.67 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_linux-x64_bin.deb (sha256)
Linux x64 RPM Package	174.03 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_linux-x64_bin.rpm (sha256)
macOS Arm 64 Compressed Archive	168.42 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_macos-aarch64_bin.tar.gz (sha256)
macOS Arm 64 DMG Installer	167.83 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_macos-aarch64_bin.dmg (sha256)
macOS x64 Compressed Archive	170.85 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_macos-x64_bin.tar.gz (sha256)
macOS x64 DMG Installer	170.26 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_macos-x64_bin.dmg (sha256)

Please note the JDK release version. As of the 17th of July 2024, Java SE Development Kit 17.0.11 is the latest version.

Step 9:

Scroll down until you find the Windows download. For your convenience, click to download the second link. This is so that you download the JDK directly, without having to unzip a compressed file.

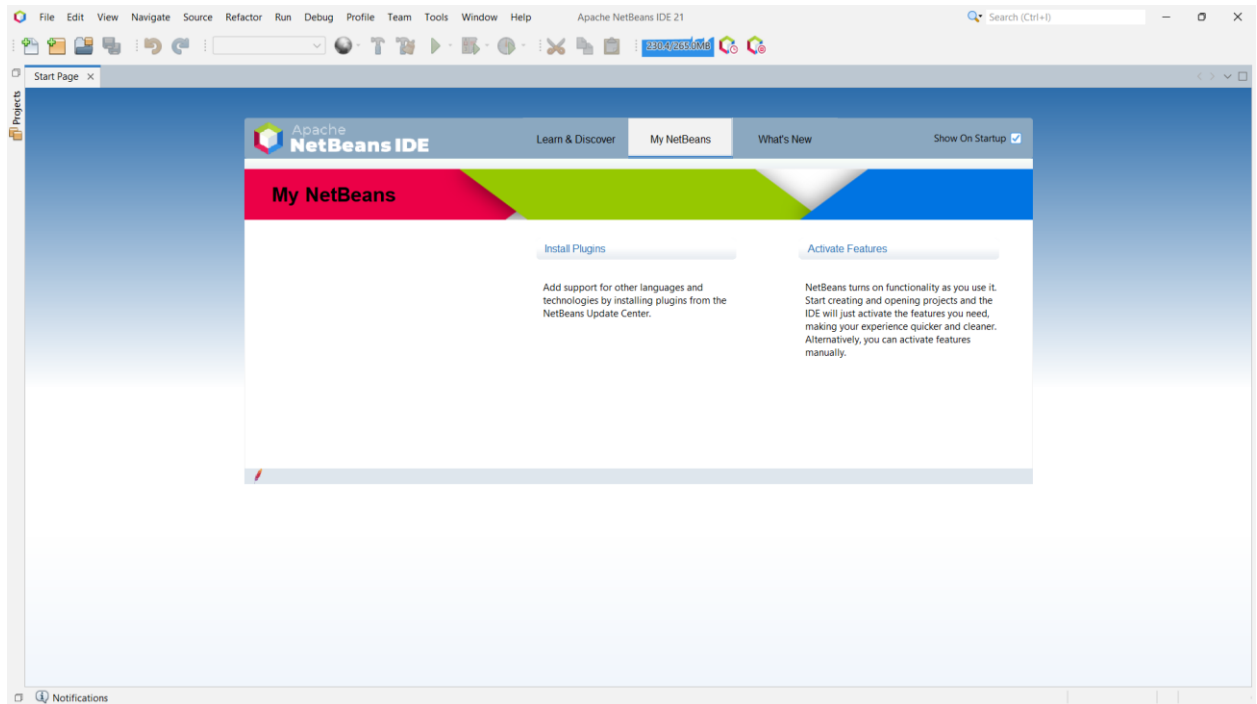


Windows x64 Compressed Archive	172.83 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_windows-x64_bin.zip (sha256)
Windows x64 Installer	153.91 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_windows-x64_bin.exe (sha256)
Windows x64 MSI Installer	152.66 MB	https://download.oracle.com/java/17/archive/jdk-17.0.11_windows-x64_bin.msi (sha256)

User Manual:

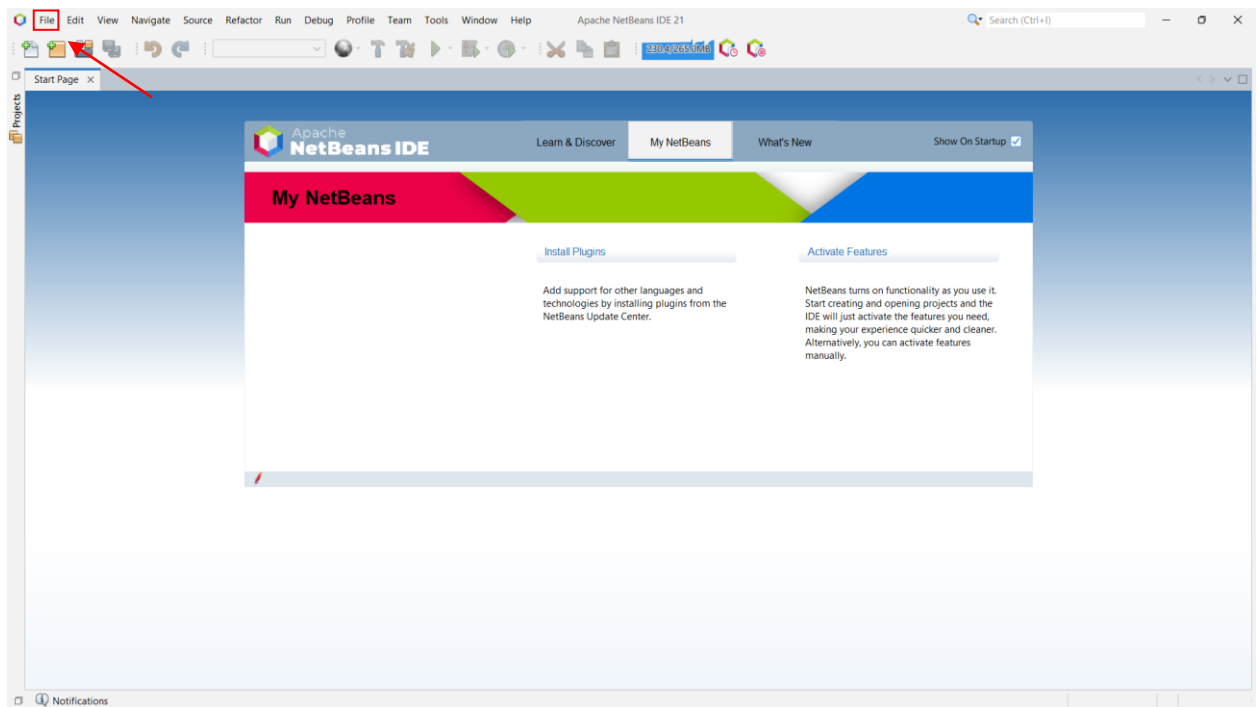
Step 1:

Now that you have successfully installed the Apache NetBeans IDE and JDK, the payroll calculator program can be put to use. The first step is to open the NetBeans applications.



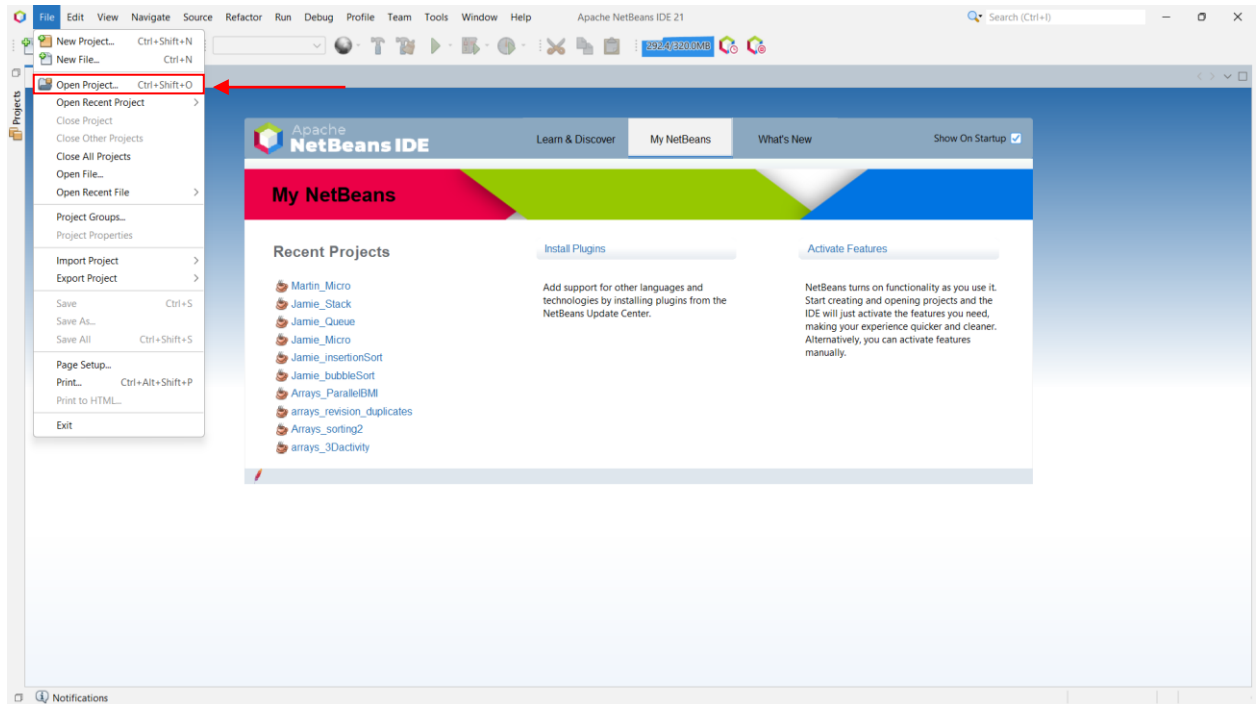
Step 2:

Hover your cursor to the top left of the screen. There is a small button labelled “File”. Click on this button.



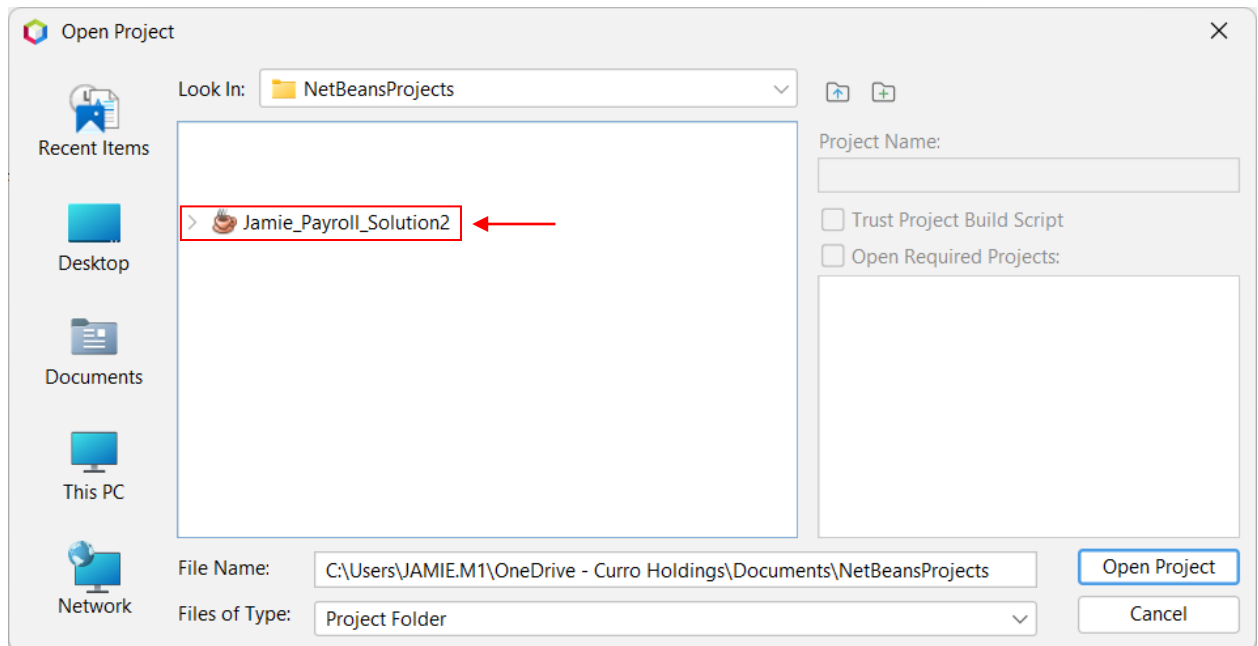
Step 3:

A drop-down will display. Click on the “Open Project” button.



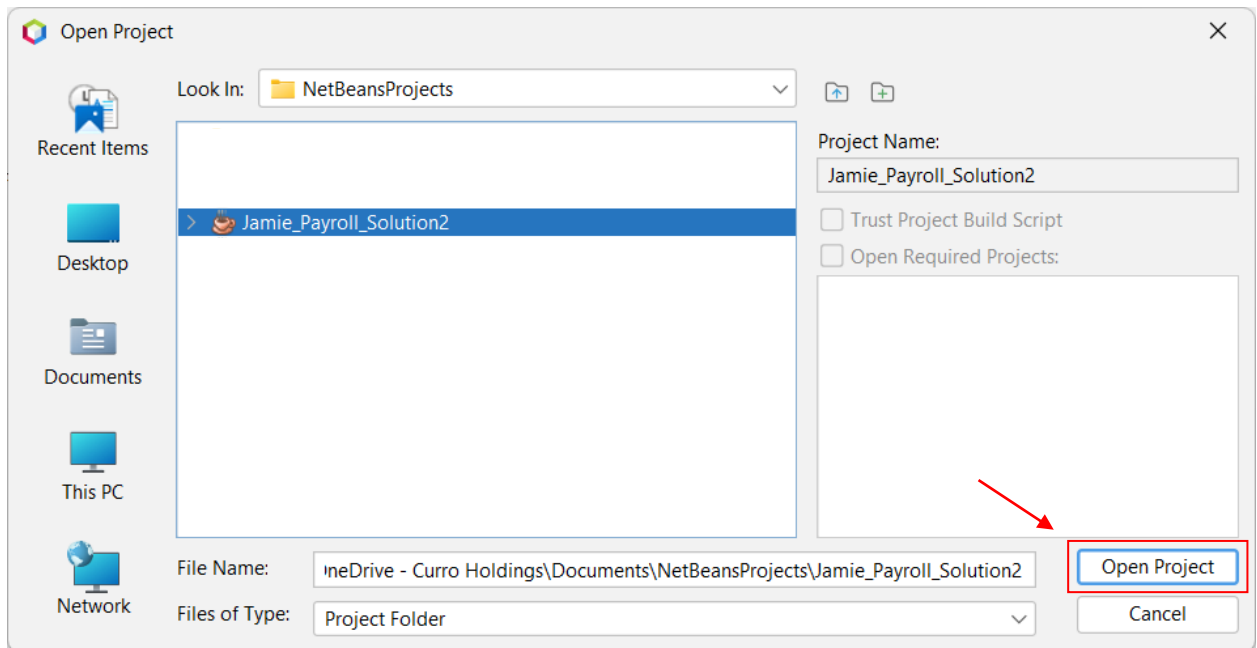
Step 4:

Open the file in the location in which it was saved.



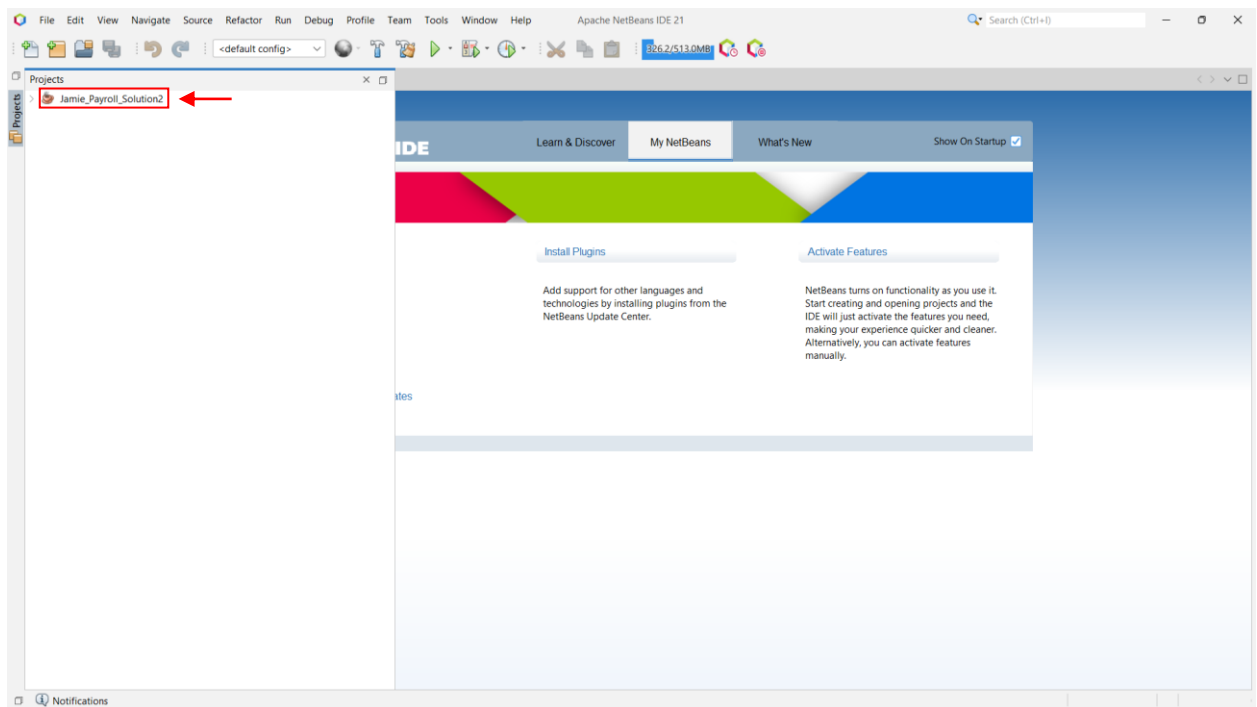
Step 5:

Press the “Open Project” button.



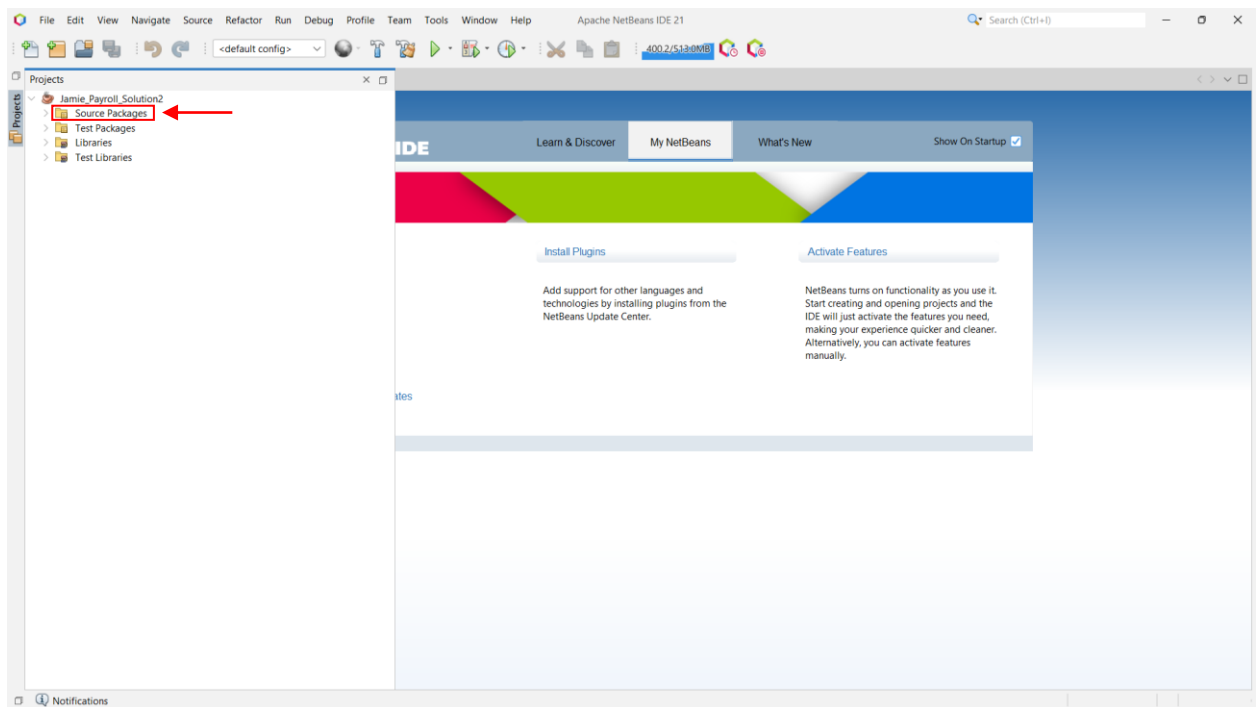
Step 6:

The Projects tab will open with the project hosting the program inside it. Double-click on the folder with the coffee icon beside the name.



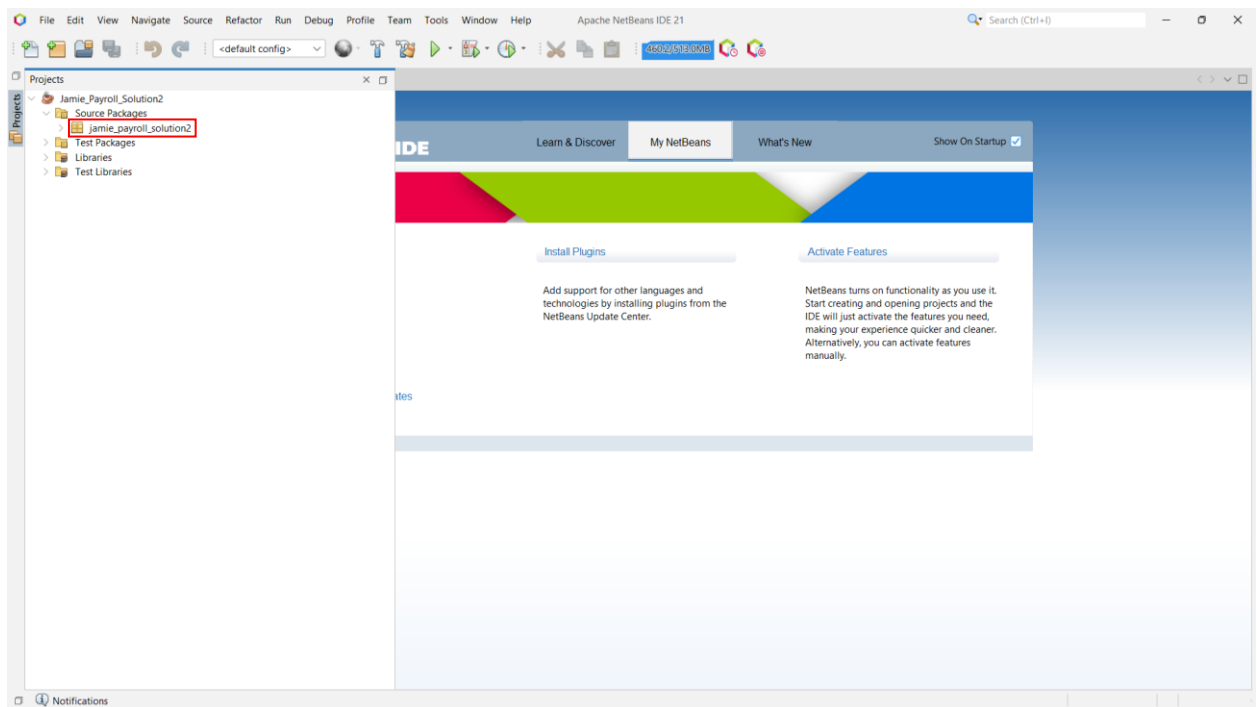
Step 7:

The folder will open with a list of files beneath it. Double-click on the button labelled “Source Packages”.



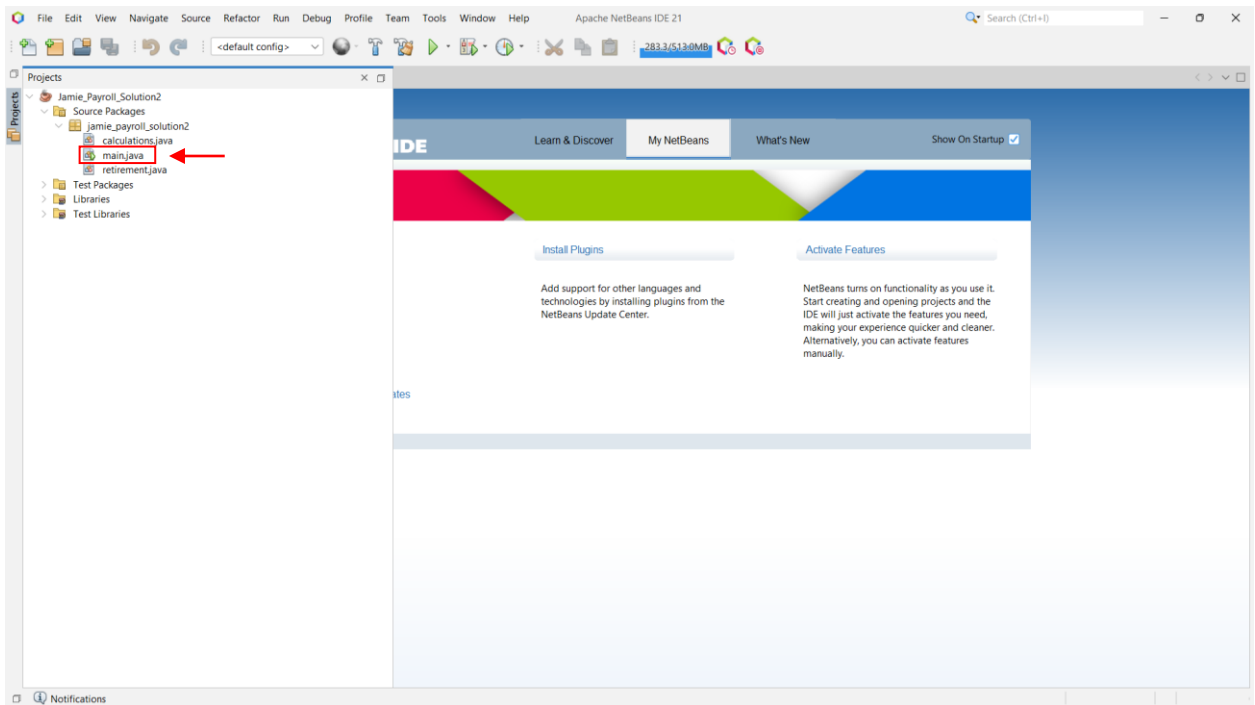
Step 8:

There will be only one source package underneath the file. This is the source package with the program. Double-click on the package to open it.



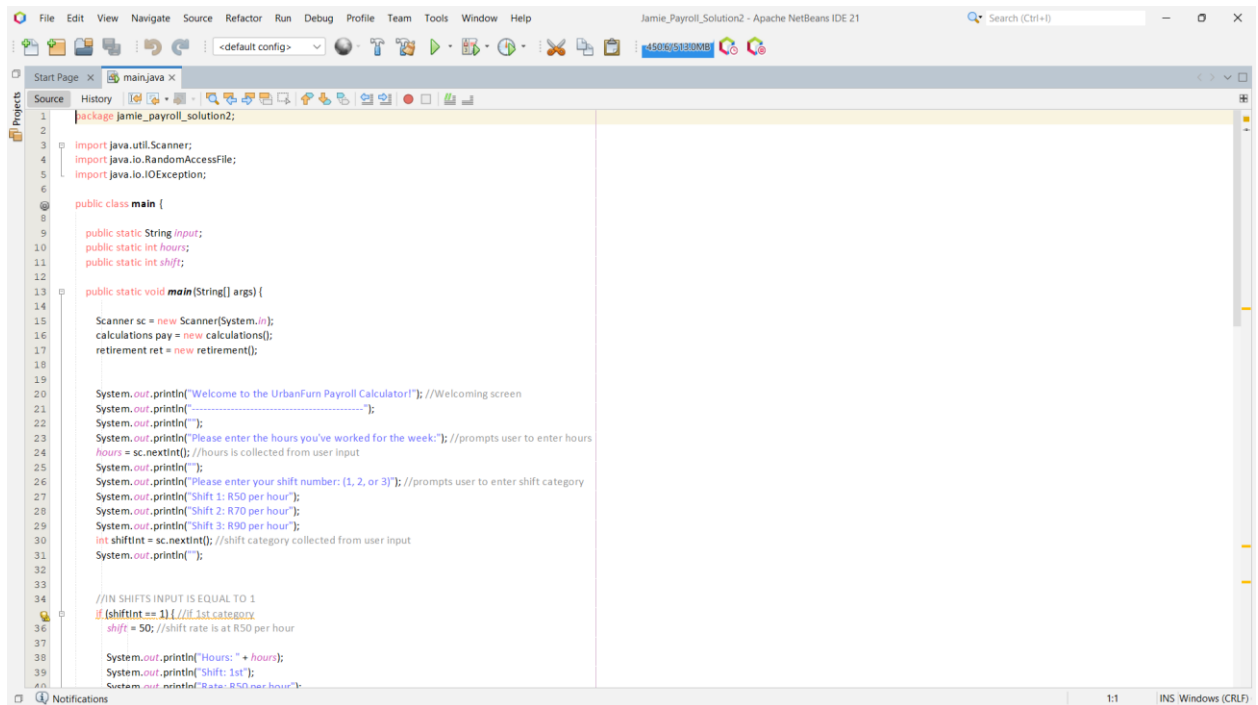
Step 9:

A list of files will open underneath. These files are the classes used to create the program. Simply double-click on the class labelled “main”.



Step 10:

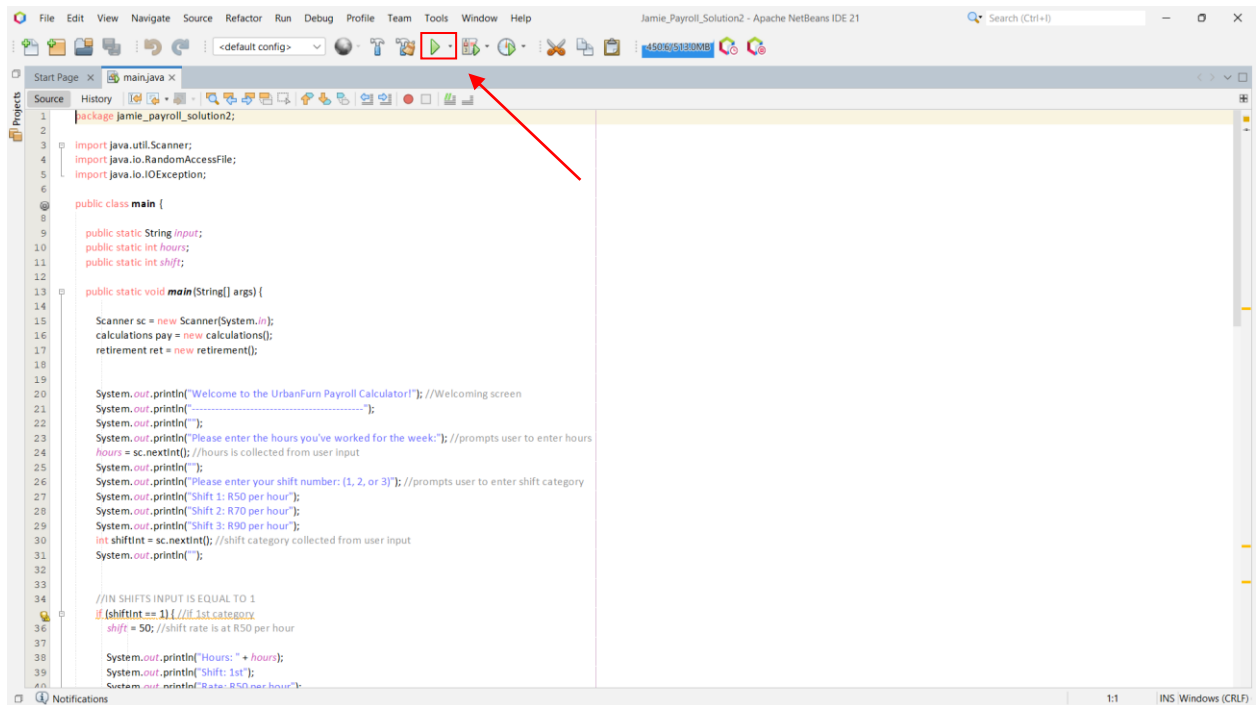
The following page will open. This page contains some portions of code for the program. **Please ensure that nothing on this page is edited.**



```
1 package jamie_payroll_solution2;
2
3 import java.util.Scanner;
4 import java.io.RandomAccessFile;
5 import java.io.IOException;
6
7 public class main {
8
9     public static String input;
10    public static int hours;
11    public static int shift;
12
13    public static void main(String[] args) {
14
15        Scanner sc = new Scanner(System.in);
16        calculations pay = new calculations();
17        retirement ret = new retirement();
18
19        System.out.println("Welcome to the UrbanFurn Payroll Calculator!"); //Welcoming screen
20        System.out.println("-----");
21        System.out.println("");
22        System.out.println("Please enter the hours you've worked for the week:"); //prompts user to enter hours
23        hours = sc.nextInt(); //hours is collected from user input
24        System.out.println("");
25        System.out.println("Please enter your shift number: (1, 2, or 3)"); //prompts user to enter shift category
26        System.out.println("Shift 1: R50 per hour");
27        System.out.println("Shift 2: R70 per hour");
28        System.out.println("Shift 3: R90 per hour");
29        int shiftint = sc.nextInt(); //shift category collected from user input
30        System.out.println("");
31
32        //IN SHIFTS INPUT IS EQUAL TO 1
33        if (shiftint == 1) { //if 1st category
34            shift = 50; //shift rate is at R50 per hour
35
36            System.out.println("Hours: " + hours);
37            System.out.println("Shift: 1st");
38            System.out.println("Rate: R50 per hour");
39        }
40    }
41}
```

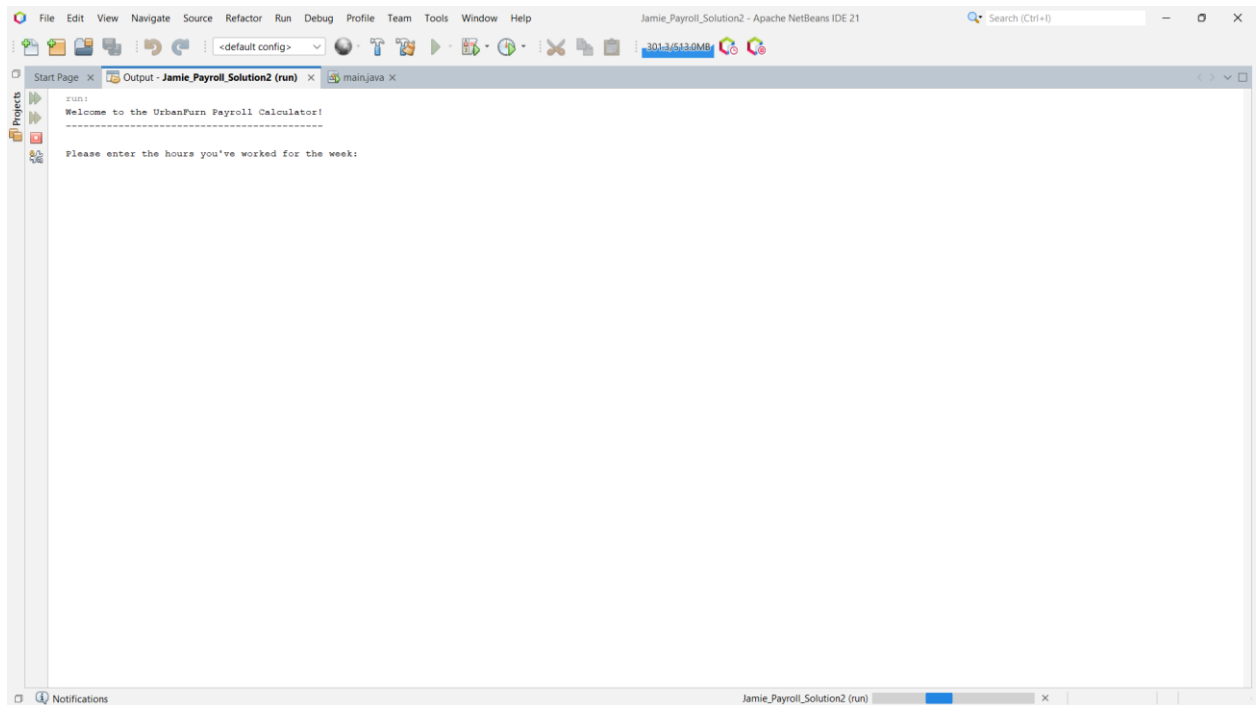
Step 11:

Click on the green button situated on the upper middle portion of the screen to start the program.



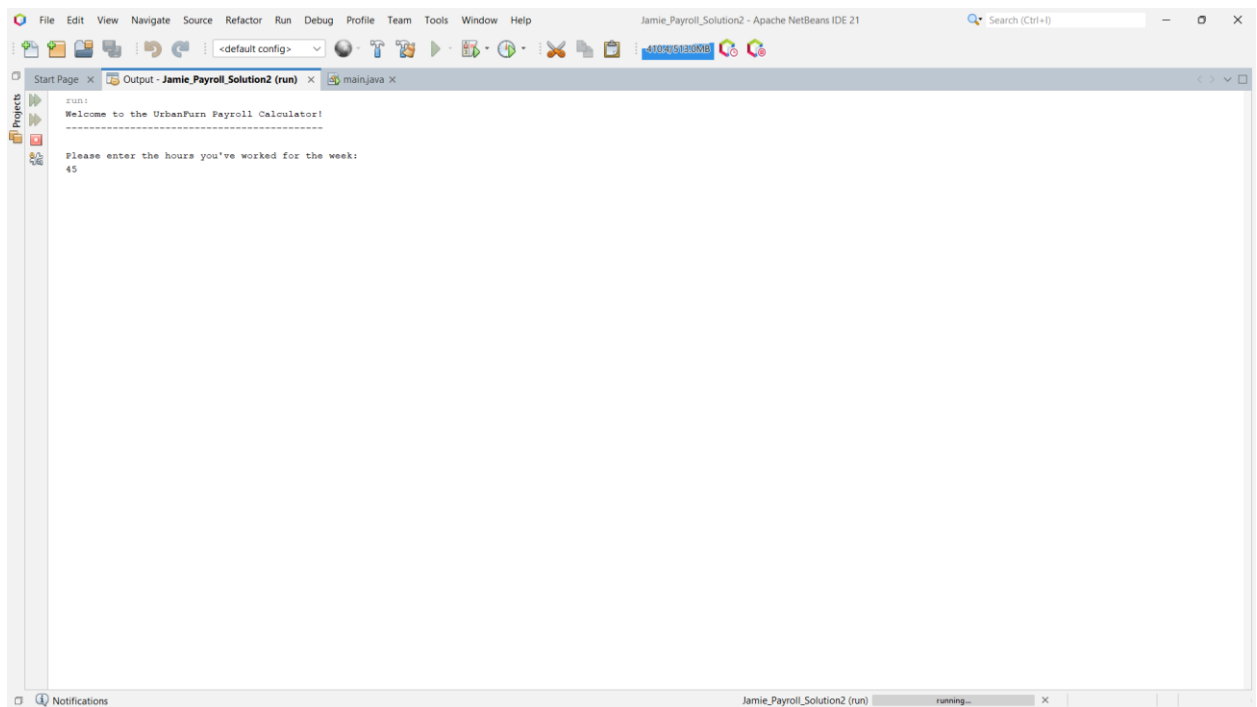
Step 12:

The following console will appear. This is where employees should input the necessary information to calculate their payrolls.



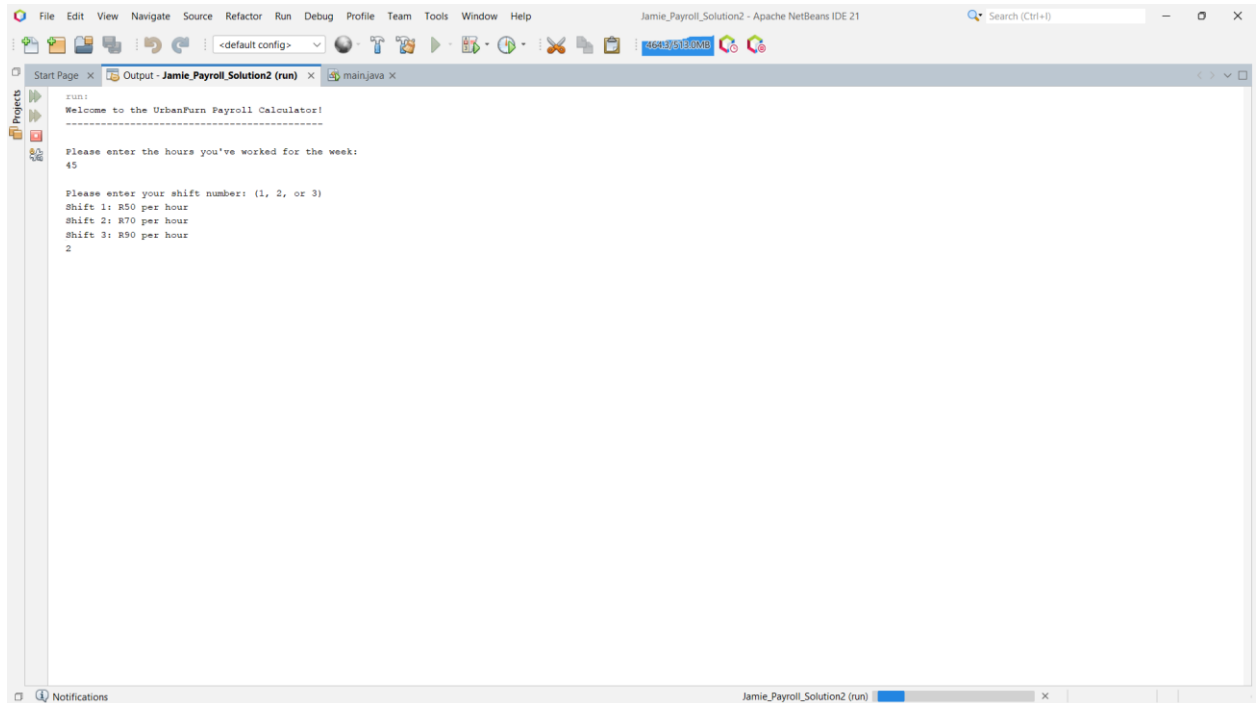
Step 13:

Input the number of hours worked for the week. An example value of 45 hours is inputted into the console.



Step 14:

Input the shift number. **Enter only the corresponding shift number into the console** – it will automatically assign the shift rate. An example value of 2 was entered into the console, amounting to R70 per hour.

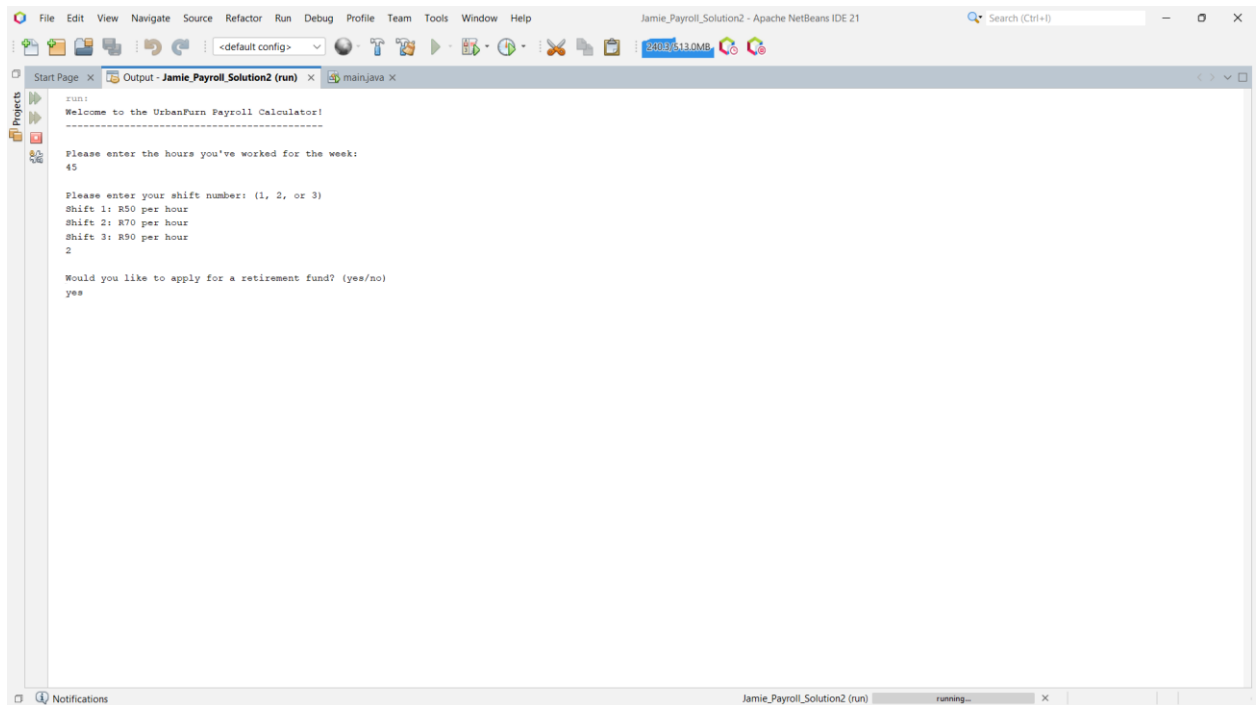


```
run:
Welcome to the UrbanPurn Payroll Calculator!
-----
Please enter the hours you've worked for the week:
45

Please enter your shift numbers: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
2
```

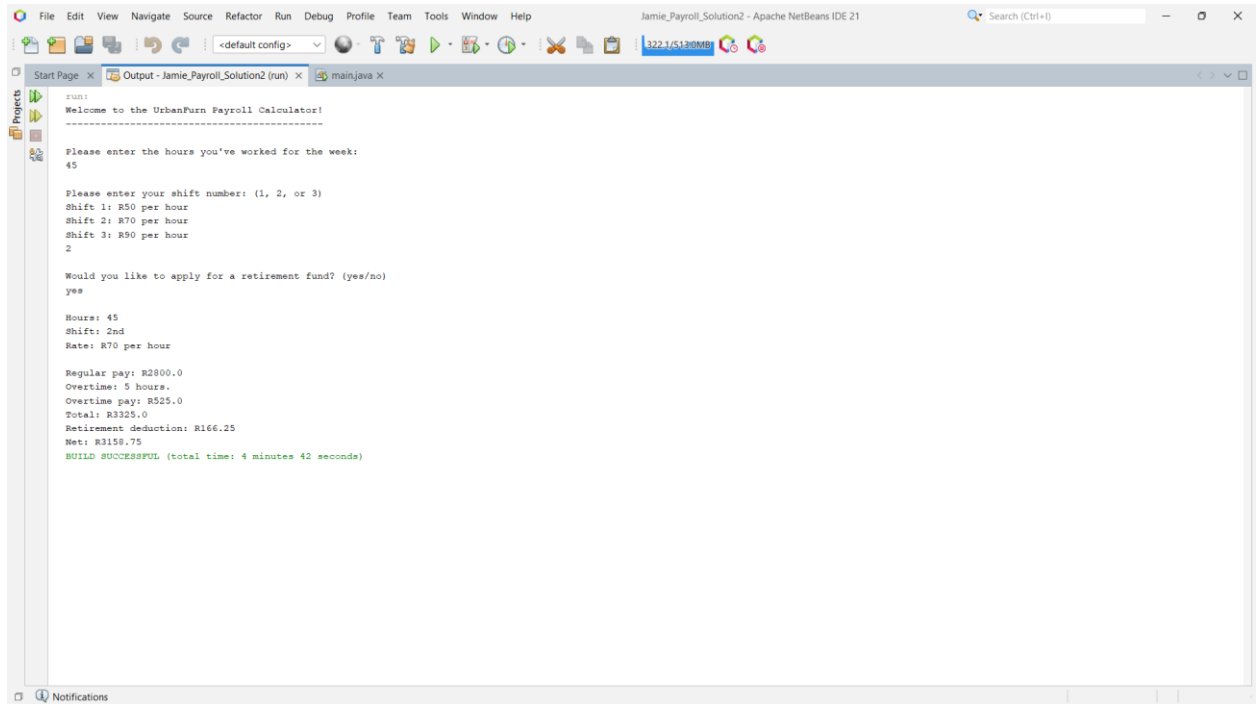
Step 15:

You will then be offered a retirement plan. This prompt only appears if you select the second or third shift. For the purpose of this user manual, the offer is accepted.



Step 16:

Once the user has selected the enter-button, a breakdown of the user's payroll will display accordingly. This includes the hours, the shift's pay rate, the regular salary, the overtime salary, and any retirement deductions, should there be any. Lastly, the net income will display.



```
run:
Welcome to the UrbanPurn Payroll Calculator!
-----
Please enter the hours you've worked for the week:
45

Please enter your shift number: (1, 2, or 3)
Shift 1: R50 per hour
Shift 2: R70 per hour
Shift 3: R90 per hour
2

Would you like to apply for a retirement fund? (yes/no)
yes

Hours: 45
Shift: 2nd
Rate: R70 per hour

Regular pay: R2800.0
Overtime: 5 hours.
Overtime pay: R525.0
Total: R3325.0
Retirement Deduction: R166.25
Net: R3158.75
BUILD SUCCESSFUL (total time: 4 minutes 42 seconds)
```

c) Installation Plan

Timelines

The creation of the program has taken four days to complete. The first day was allocated to the coding of the program, and three days were allocated to the documentation. The program has completed its development process and will be taken to UrbanFurn for integration into their systems.

Installation of the necessary resources will be done on the third day.

To install the program into the company's system, there will be a physical meetup with the company. I will then transfer the program from the device on which it was created, onto the devices and systems of the company. This will occur on the fourth day of development.

Resources

There aren't many resources that are required for this program. UrbanFurn is, however, to ensure that they have at least one working computer. This computer should preferably be a Windows 11 device with the necessary specifications.

The processor (Computer Processing Unit) should have at least an Intel Core i5 or higher, a recommended memory of 8GB of RAM, and a solid-state drive for faster performance in terms of storage. The recommended capacity is 256GB.

The graphics card should have an integrated CPU and the device should have a display of approximately 13-14 inches, which is sufficient for easy usage. The resolution of the device can be about 1920 x 1080, which is full HD. This is not required but it would be beneficial.

The battery life of the machine should have at least 8 hours for all day usage, and once again, it is recommended that the operating system be Windows 11.

In terms of its connectivity, there should be the sufficient standard ports as well as Wi-Fi 6 and Bluetooth 5.0 for internet purposes.

There will be an installation of Apache NetBeans onto their systems, as well as the JDK to run Java.

Contingency Measures

Contingency measures have also been created to minimize any losses and damages caused by any unforeseen negative events.

One aspect that the company should be wary of is the accidental installation of viruses should there be any malicious content within resources that need to be

downloaded from the internet. This program will not be affected, but the company's systems may be.

To combat this, an accurate installation guide will be given to the company to ensure that they download content from the correct sites and from reputable sources.