Java Lab

Input using the Scanner class

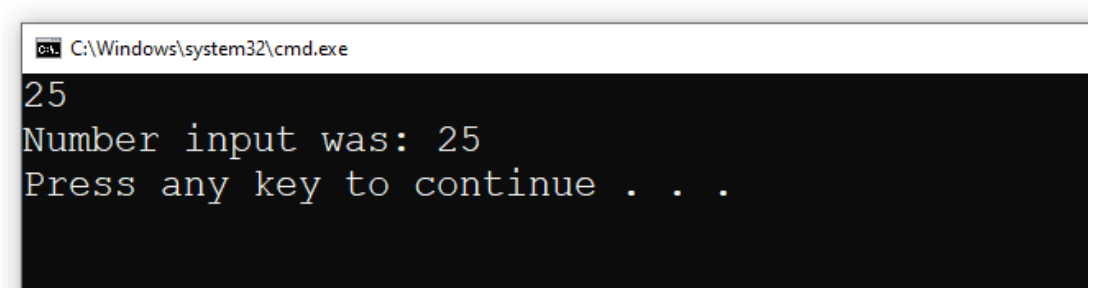
IMPORTANT! Save all your work to a safe location such as oneDrive.

Create a folder for SDPD into which you will save all your work for this module, arranged how you wish. Ideally you should create a folder each week for your lab exercises. Note that you should create **a separate file** for each exercise.

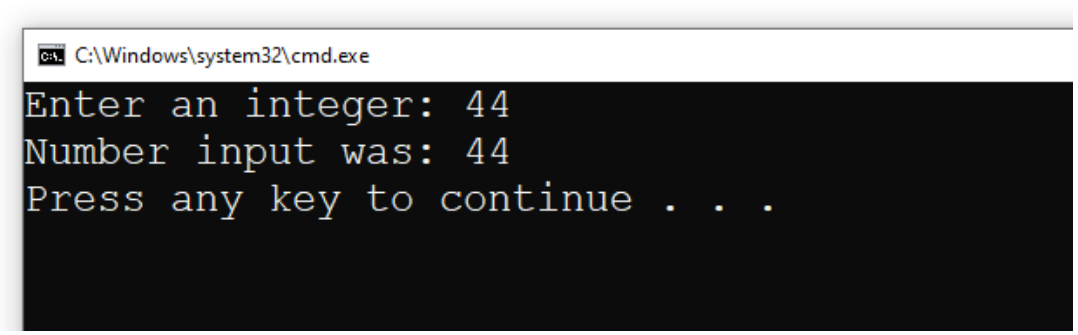
Exercise 1

Goal: Create a program in Java using TextPad that contains an int variable. Ensure it compiles and runs successfully. Using the Scanner class, prompt the user to input a number, then output the number entered to the console.

1. Create a new file called JavaScanner1 for this exercise.
   Following the guide below, create a program that has the following specification:
   - Import the java.util.Scanner:
     ```
     import java.util.Scanner;
     ```
   - Create an instance of the Scanner object:
     ```
     Scanner keyboard = new Scanner(System.in);
     ```
   - Write Java statements that declare the following variable: *number1* of type int
   - Write Java statements that will prompt the user to enter an integer via the console:
     ```
     number1 = keyboard.nextInt();
     ```
   - Write a Java statement that will output the number the user entered
   - The output should be similar to as shown below:



Amend your code so that when the program runs, a message is displayed to the user to enter an integer:



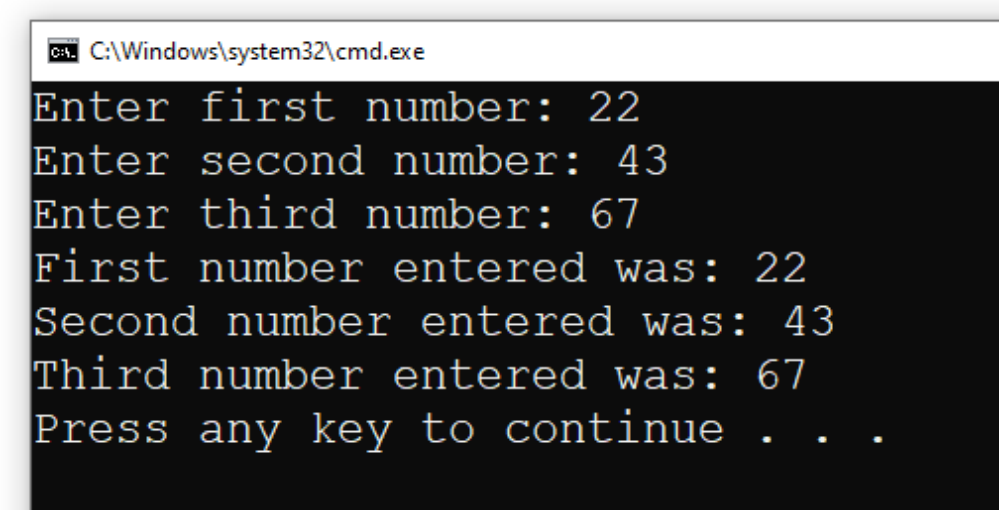
Exercise 2

Goal: Create a program in Java that contains three integer variables. Ensure it compiles and runs successfully. Using the Scanner class, prompt the user to input 3 integer numbers, then output the numbers entered to the console.

Create a new file called JavaScanner2 for this exercise.

Following the guide below, create a program that has the following specification:

- Write Java statements that declare the following variables: *num1, num2,* and *num3* of type int.
- Compile and run your program. Your output should be similar to as shown below:



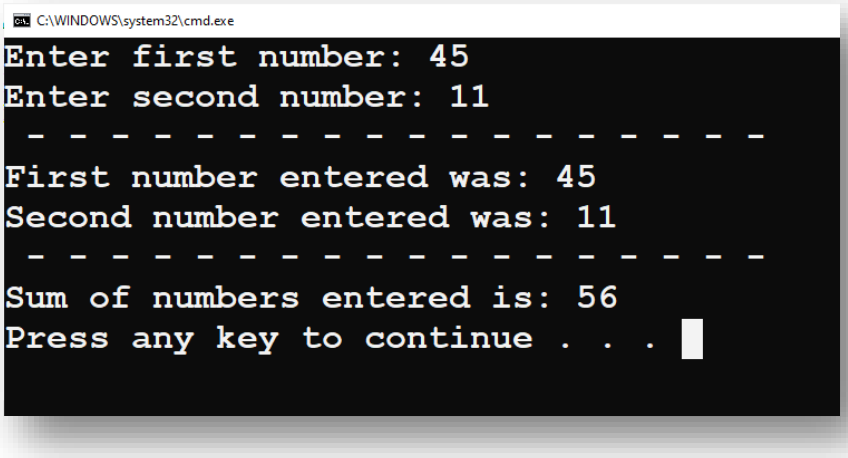
Exercise 3

Goal: Create a program in Java that calculates the sum of two integer variables that will be input by the user. Ensure it compiles and runs successfully.

Create a new file called JavaScanner3 for this exercise.

Following the guide below, create a program that has the following specification:

- Write Java statements that declare the following variables:
  - *num1* as an int
  - *num2* as an int
- Compile and run your program. Your output should be similar to as shown below, showing the sum of both numbers entered:



Amend your code so that the program also outputs the average of the two numbers entered.

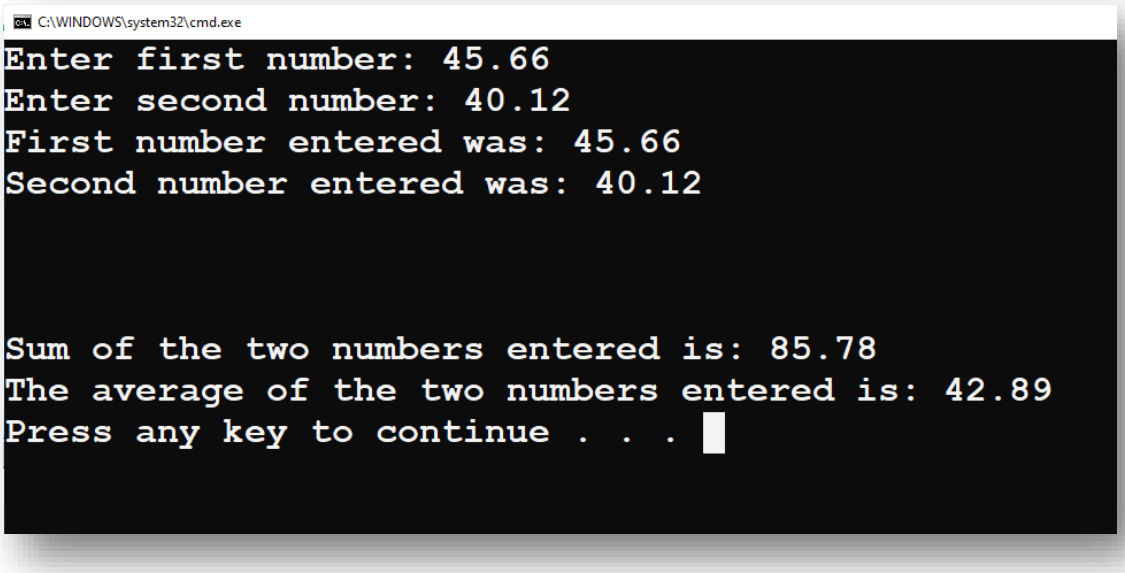
Exercise 4

Goal: Create a program in Java calculating the sum of two double variables that will be input by the user. Ensure it compiles and runs successfully.

Create a new file called JavaScanner4 for this exercise.

Following the guide below, create a program that has the following specification:

- Write Java statements that declare the following variables:
  - *num1* as a double
  - *num2* as a double
- Compile and run your program. Your output should be similar to as shown below, showing the sum of both numbers entered:



Amend your code so that the program also outputs the average of the two numbers entered.

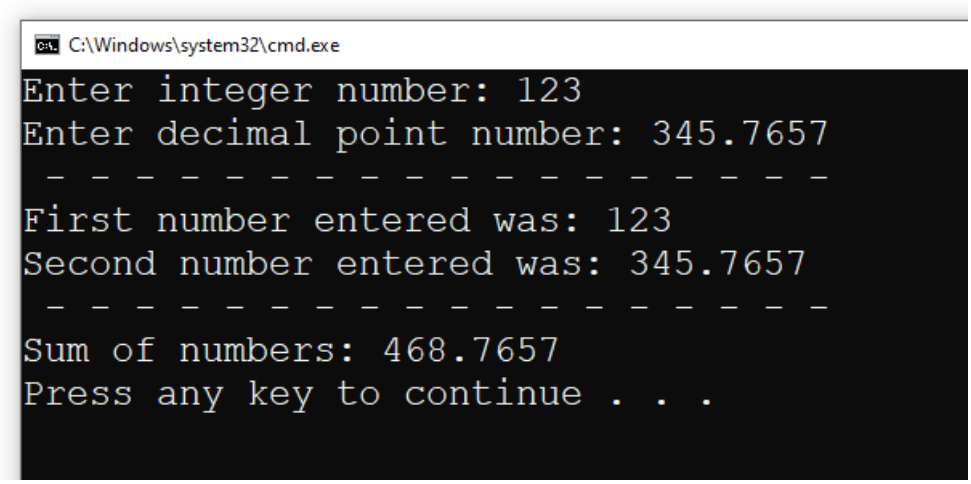
Exercise 5

Goal: Create a program in Java calculating the sum of two mixed variables that will be input by the user. Ensure it compiles and runs successfully.

Create a new file called JavaScanner3 for this exercise.

Following the guide below, create a program that has the following specification:

- Write Java statements that declare the following variables:
  - *num1* as an int
  - *num2* as a double
- Compile and run your program. Your output should be similar to as shown below, showing the sum of both numbers entered:



Amend your code so that the program also outputs the average of the two numbers entered.

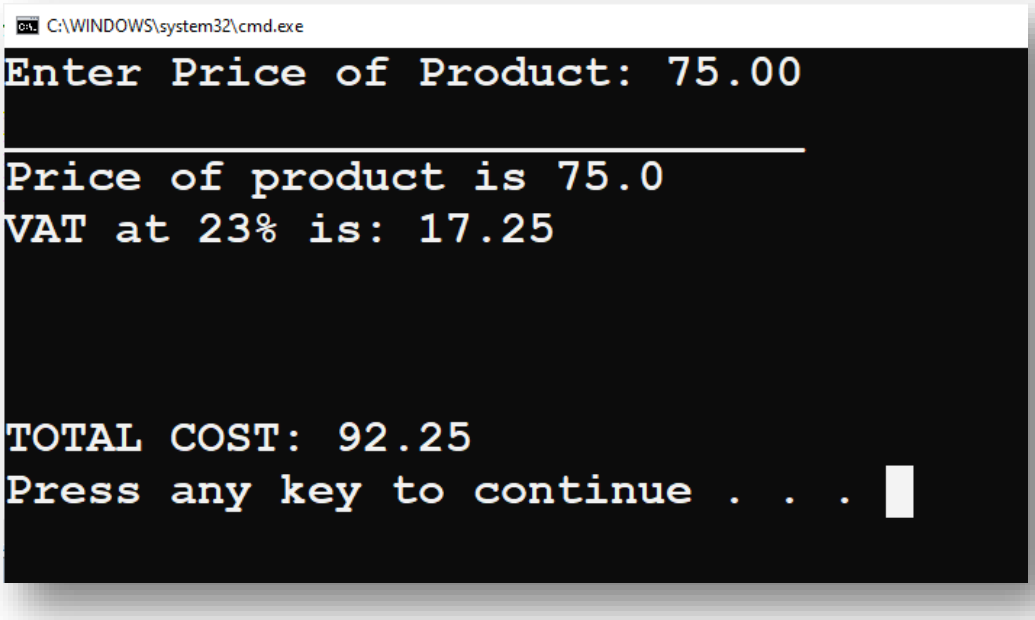
Exercise 6

Goal: Create a program in Java calculating the cost of VAT based on a price entered by the user. Ensure it compiles and runs successfully.

Create a new file called JavaScanner6 for this exercise.

Following the guide below, create a program that has the following specification:

- Write Java statements that declare the following variables:
  - *price* as a double
  - *vat* as a double (assuming that the rate of VAT is 23%)
  - *finalPrice as a double (this will be the price plus the VAT)*
- Compile and run your program. Your output should be similar to as shown below, showing the sum of both numbers entered:

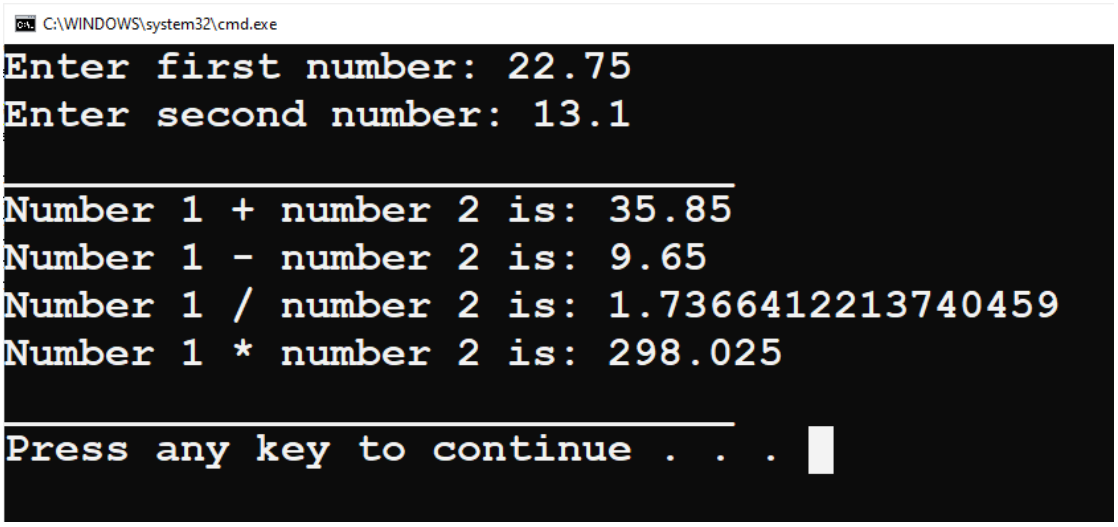


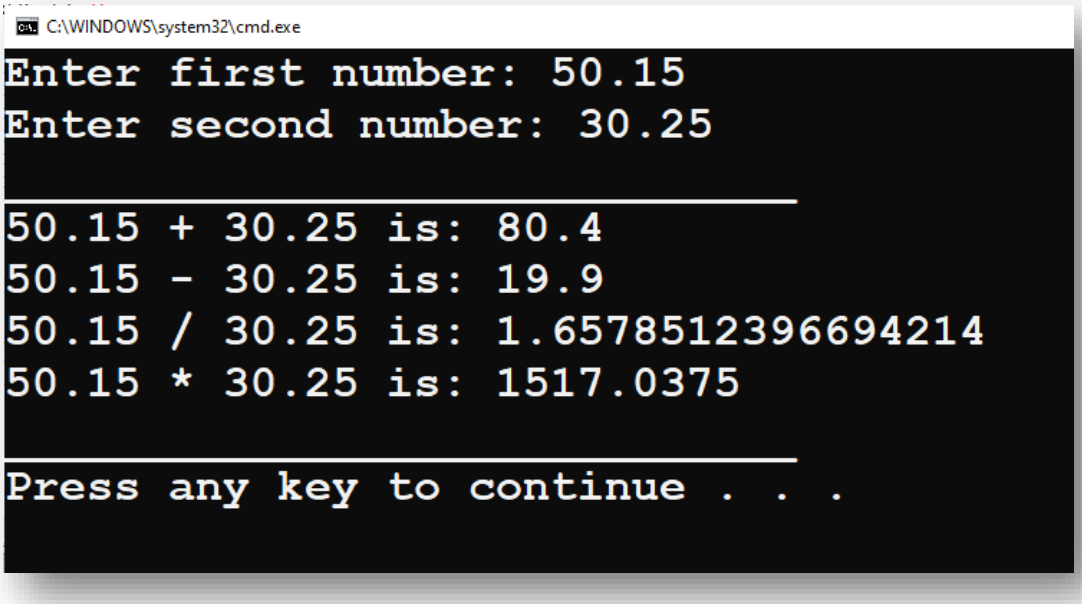
Exercise 7

Goal: Create a calculator program in Java that will perform addition, subtraction, division and multiplication based on two numbers entered by the user. Ensure it compiles and runs successfully.

Create a new file called JavaScanner7 for this exercise.

Your program should allow the user to enter numbers that include decimal points. Your output should be similar to as shown below,showing the following results:





Exercise 8

Goal: Create a program in Java that prompts the user to input their name and displays a sentence based on the input.

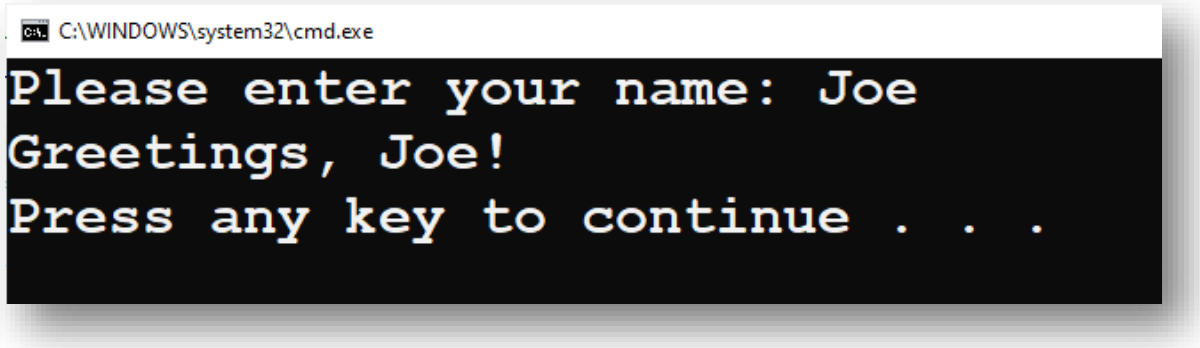
1. Create a new file called JavaScanner8 for this exercise.

   Note that this program will allow the user to enter a string into the console. The *nextLine()* method (on line 17 below) will store what is entered by the user to the string variable called name).

   Create the following a program:

```
1  import java.util.Scanner;
2
3  public class JavaScanner8 {
4      public static void main(String[] args)
5      {
6
7              //Create instance of Scanner object
8              Scanner keyboard = new Scanner(System.in);
9
10             //Declare a string variable called name
11             String name;
12
13             //Prompt the user to enter their name
14             System.out.print("Please enter your name: ");
15
16             //Store what is typed to the variable created in line 11
17             name = keyboard.nextLine();
18
19             //Output to the console displaying greeting
20             System.out.println("Greetings, " + name + "! ");
21     }
22 }
```

   Ensure that this generates the output as shown below:



Exercise 9

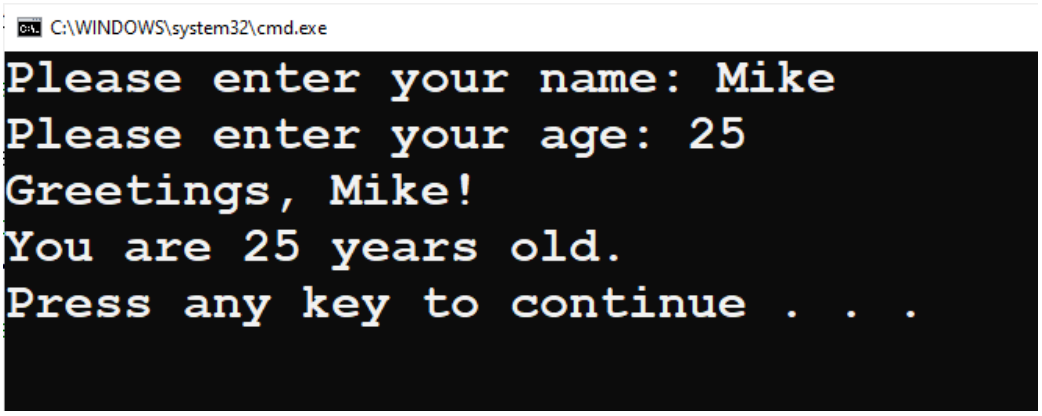
Goal: Create a program in Java that prompts the user to input their name and age, and displays a sentence based on the input.

1. Create a new file called JavaScanner9 for this exercise.

   Your program should allow the user to enter 2 values, saved at the following data types:

   - Their name (as a String)
   - Their age (as an int)

   Your program should produce output similar to as shown below:



Exercise 10

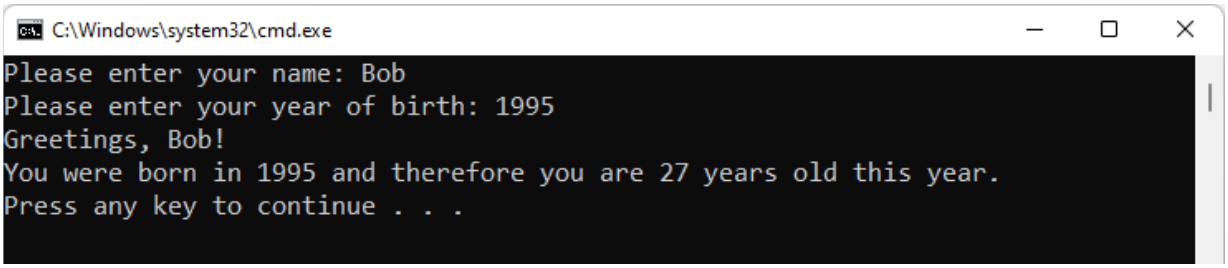
Goal: Create a program in Java that prompts the user to input their name and their year of birth, and displays a sentence based on the input.

1. Create a new file called JavaScanner10 for this exercise.

   Your program should allow the user to enter 2 values, saved at the following data types:

   - Their name (as a String)
   - Their year of birth (as an int)

Your program should produce output similar to as shown below:



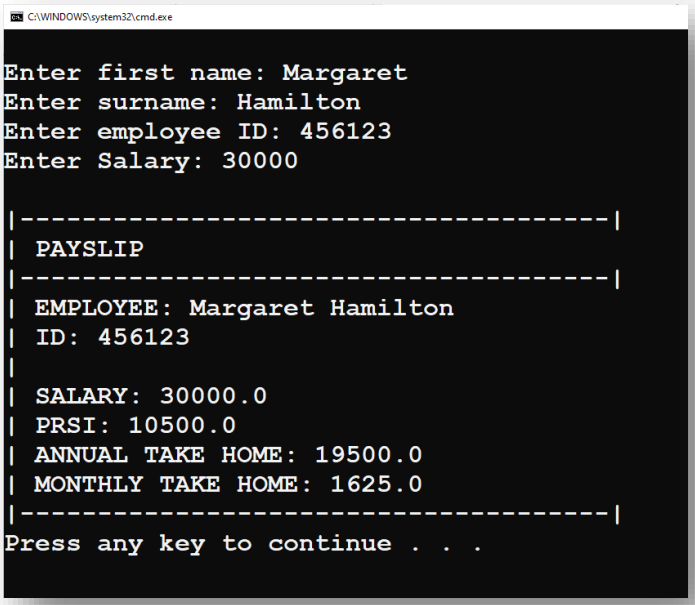
Exercise 11

Goal: Create a program in Java that allows input from the keyboard. The program should generate a payslip based on the information provided by the user, calculating both annual and monthly take home pay. Ensure it compiles and runs successfully.

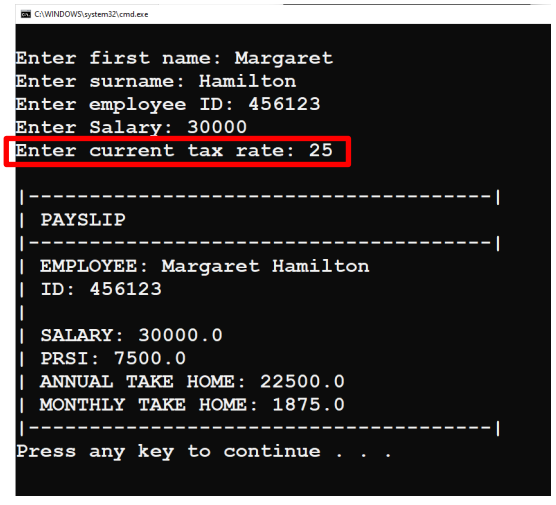
Create a new file called JavaScanner11 for this exercise.

Following the guide below, create a program that has the following specification:

- Prompts the user to enter a first name
- Prompts the user to enter a surname name
- Prompts the user to enter a user ID
- Prompts the user to enter a salary
- Compile and run your program. Your output should be similar to as shown below. PRSI (tax) is 35% of the entered salary. This is deducted from the salary amount and what remains is the take home.



Amend your code so that the tax rate is entered by the user, eg:



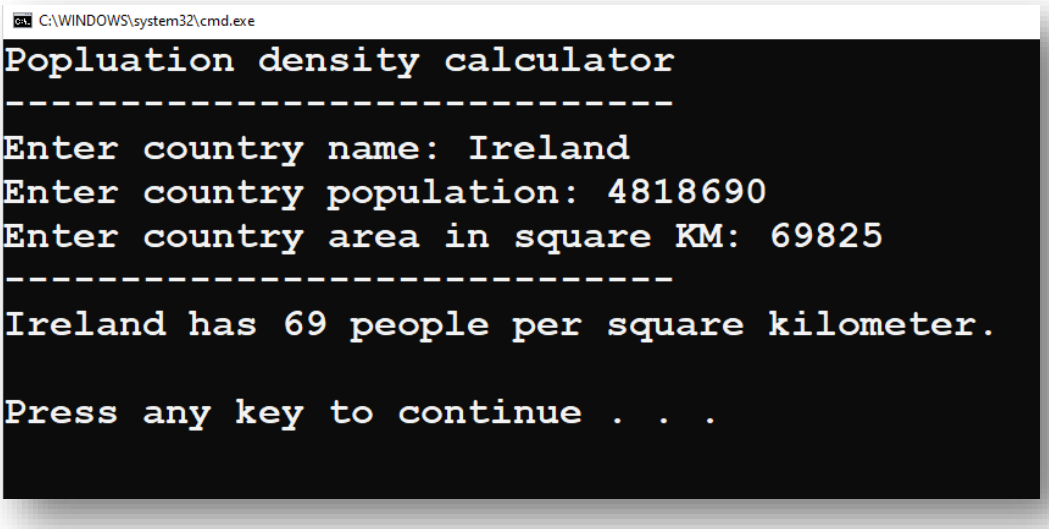
Exercise 12

Goal: Create a program in Java that allows input from the keyboard. The program should calculate the number of people per square kilometer. Ensure it compiles and runs successfully.

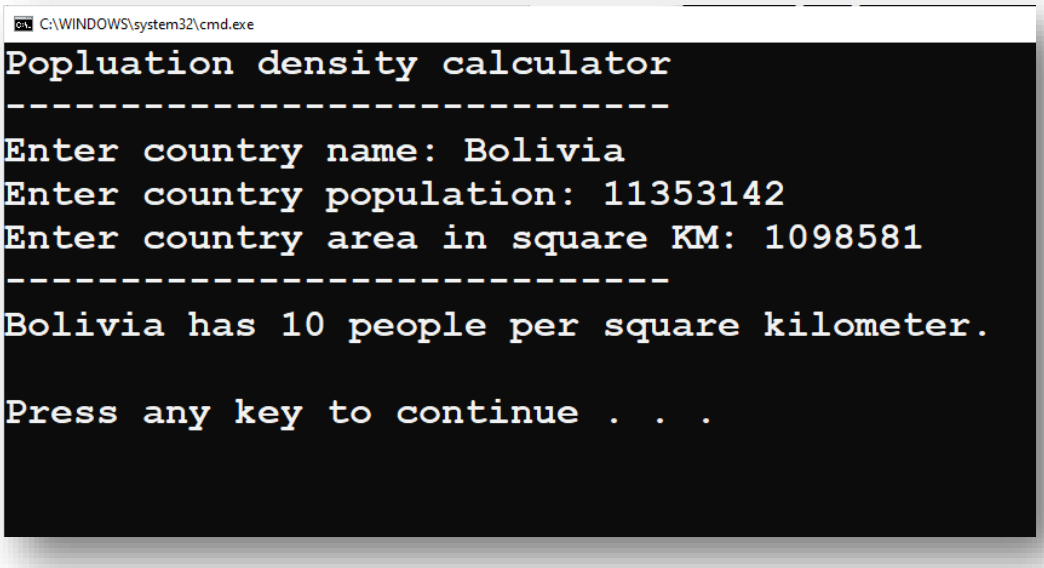
Create a new file called JavaScanner12 for this exercise.

Following the guide below, create a program that has the following specification:

- Prompts the user to enter a country name
- Prompts the user to enter the country population
- Prompts the user to enter the size of the country in square kilometers
- Output the number of people per square kilometer:



or



Test your program with the following and complete the table:

Country	Population	Area km²	People per km²
China *	1,427,647,786	9,596,961	149
India *	1,352,642,280	3,287,263	411
United States *	327,096,265	9,629,091	34
Indonesia *	267,670,543	1,910,931	
Pakistan *	212,228,286	796,095	
Brazil *	209,469,323	8,514,877	
Nigeria *	195,874,685	923,768	
Bangladesh *	161,376,708	147,570	
Russia *	145,734,038	17,098,246	
Japan *	127,202,192	377,930	