



## Java Lab

### JOptionPane

**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 that displays a popup window using the `JOptionPane.showMessageDialog` method

```
import javax.swing.JOptionPane;

public class Joption1 {
    public static void main(String[] args){

        JOptionPane.showMessageDialog(null, "Hello World!");

    }
}
```

Create a new a Java program that imports `JOptionPane` (as shown above) and outputs a message that says “Hello World” similar to as shown below:



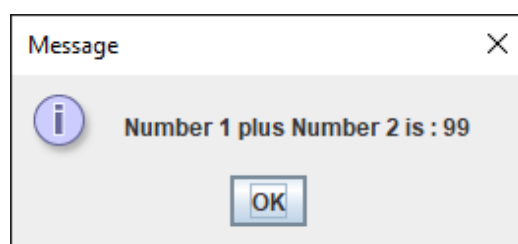
# Exercise 2

**Goal:** Create a program in Java that displays a popup window

`JOptionPane` provides an alternative means of output to the screen using the show message dialog method. Create a program that contains 2 integer variables called `num1` and `num2` that have the values 55 and 44, eg:

```
int num1 = 55;
int num2 = 44;
```

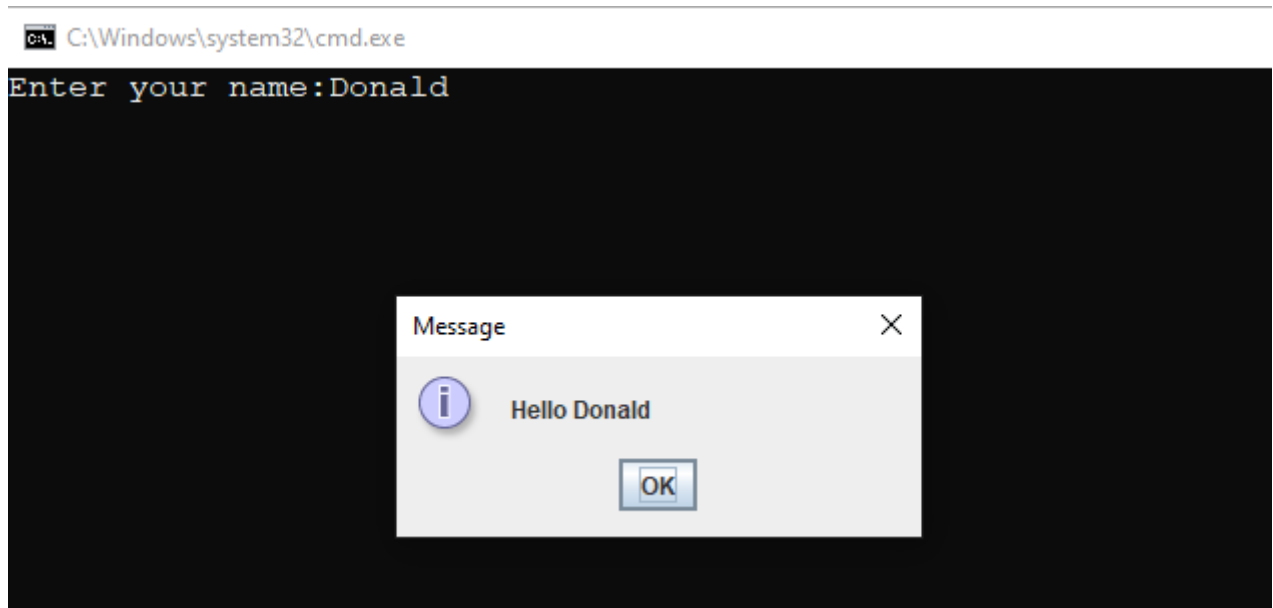
The program should then output the sum of these two numbers using `showMessageDialog`. Your result should be similar to as shown below:



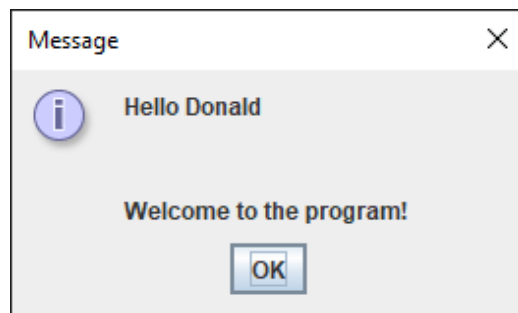
## Exercise 3

**Goal: Create a program in Java that displays a popup window**

Create a program that prompts the user to enter their name (using scanner for the input) and outputs a message similar to as shown below. The output message should be generated using *showMessageDialog*:



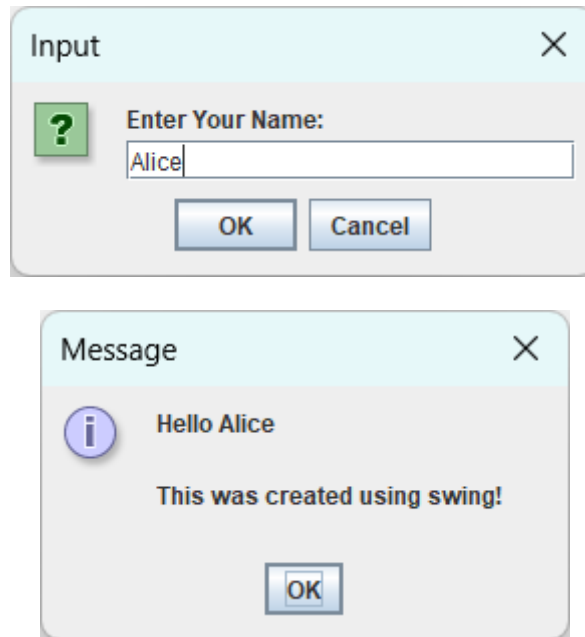
Amend your code so that the output is as shown:



## Exercise 4

**Goal: Create a program in Java that displays a popup and input window**

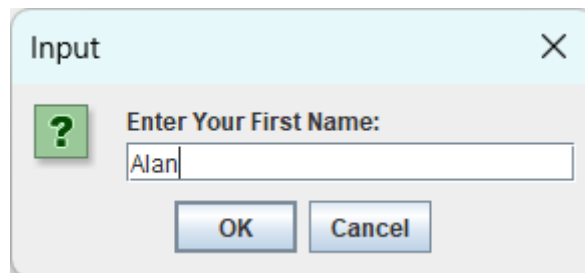
Create a program that prompts the user to enter their name (using `JOptionPane.showInputDialog` for the input) and outputs a message, similar to as shown below:



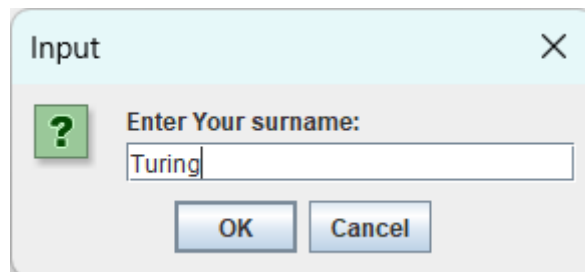
## Exercise 5

**Goal: Create a program in Java that displays a popup and input window**

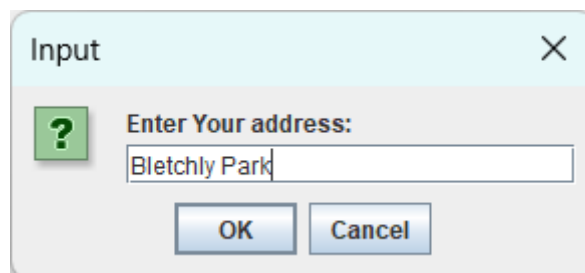
Create a program that prompts the user to enter their first name, surname and address, and outputs the results:



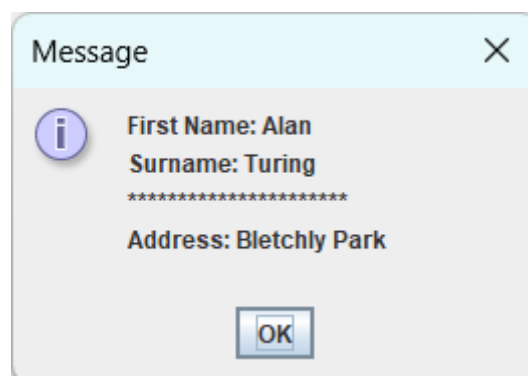
Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the label "Enter Your First Name:", a text input field containing "Alan", and "OK" and "Cancel" buttons.



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the label "Enter Your surname:", a text input field containing "Turing", and "OK" and "Cancel" buttons.



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the label "Enter Your address:", a text input field containing "Bletchly Park", and "OK" and "Cancel" buttons.

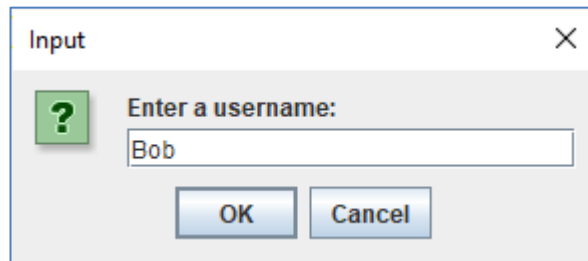


Message dialog box titled "Message" with a close button (X). It contains a purple information icon (i), the text "First Name: Alan", "Surname: Turing", a line of asterisks "\*\*\*\*\*", and "Address: Bletchly Park". It has an "OK" button.

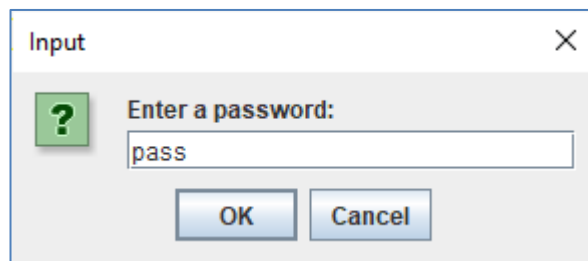
## Exercise 6

### Goal: Create a logon program in java

Create a new a Java program that will allow the user to input a username, and output the following results, based on the name and password entered. Based on the name entered, the output should be as shown below:

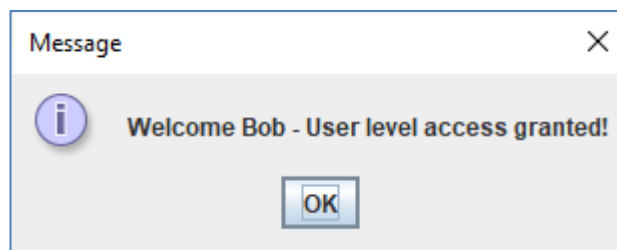


A Java Swing dialog box titled "Input" with a close button (X) in the top right corner. It contains a green question mark icon on the left. To the right of the icon is the label "Enter a username:". Below the label is a text input field containing the text "Bob". At the bottom of the dialog are two buttons: "OK" and "Cancel".



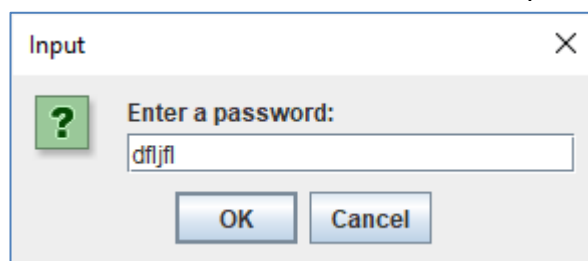
A Java Swing dialog box titled "Input" with a close button (X) in the top right corner. It contains a green question mark icon on the left. To the right of the icon is the label "Enter a password:". Below the label is a text input field containing the text "pass". At the bottom of the dialog are two buttons: "OK" and "Cancel".

Access granted with correct username and password:

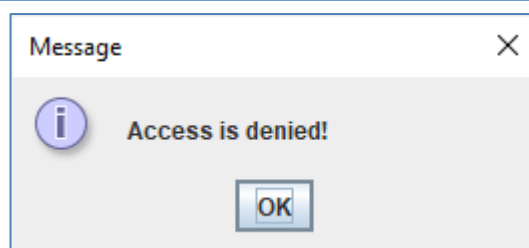


A Java Swing dialog box titled "Message" with a close button (X) in the top right corner. It contains a purple information icon (i) on the left. To the right of the icon is the text "Welcome Bob - User level access granted!". At the bottom of the dialog is a single button: "OK".

Access denied with incorrect username and password:



A Java Swing dialog box titled "Input" with a close button (X) in the top right corner. It contains a green question mark icon on the left. To the right of the icon is the label "Enter a password:". Below the label is a text input field containing the text "dfijfl". At the bottom of the dialog are two buttons: "OK" and "Cancel".



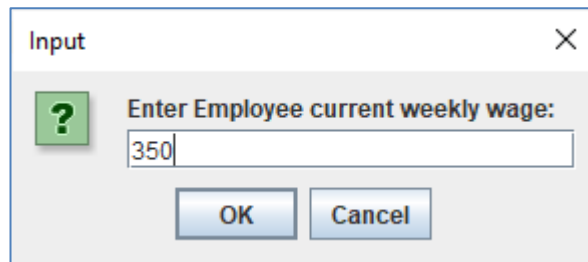
A Java Swing dialog box titled "Message" with a close button (X) in the top right corner. It contains a purple information icon (i) on the left. To the right of the icon is the text "Access is denied!". At the bottom of the dialog is a single button: "OK".

There should also be an option for the username "Admin" with a password of "super".

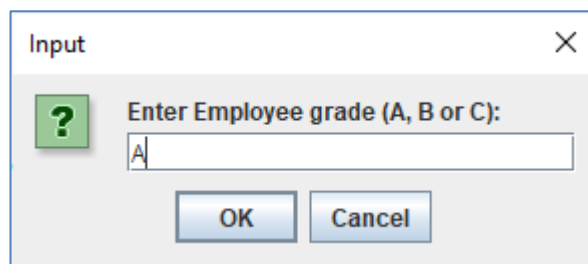
## Exercise 7

### Goal: Create a wage calculator program in java

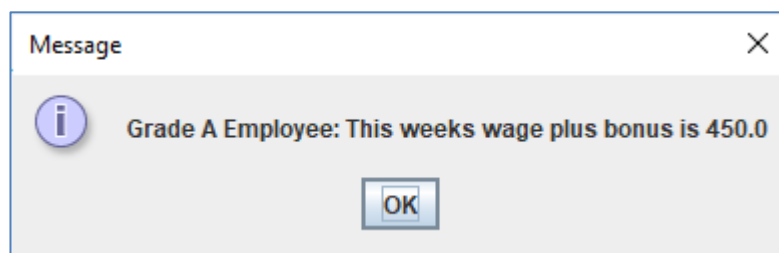
Create a new a Java program that uses JOptionPane input and message boxes to calculate wages and weekly bonus based on input. The user is prompted to enter the weekly wage of an employee, and then a grade for that employee – either A, B or C. If the employee gets grade a, then they get a bonus of 100 euros extra for the week, grade B and they get a bonus of 50 euros extra for the week, grade C gets a bonus of 15 euros extra for the week, and any other input gets no bonus for the week. Your output can be similar to as shown below:



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Employee current weekly wage:", a text input field containing "350", and "OK" and "Cancel" buttons.

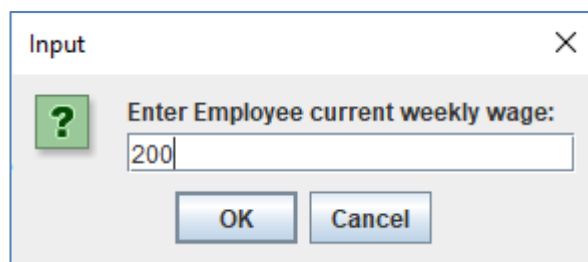


Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Employee grade (A, B or C):", a text input field containing "A", and "OK" and "Cancel" buttons.

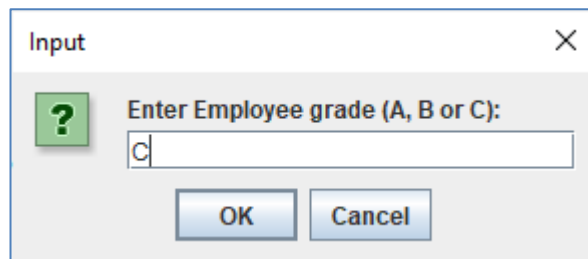


Message dialog box titled "Message" with a close button (X). It contains an information icon (i), the text "Grade A Employee: This weeks wage plus bonus is 450.0", and an "OK" button.

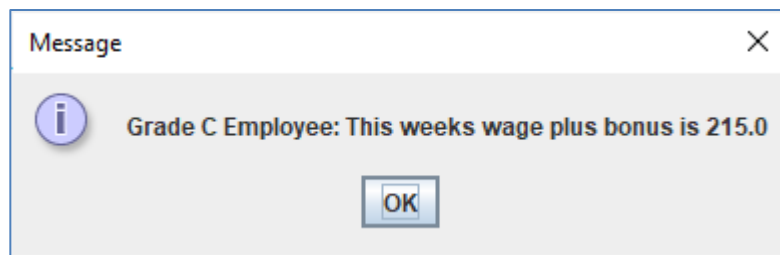
or



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Employee current weekly wage:", a text input field containing "200", and "OK" and "Cancel" buttons.



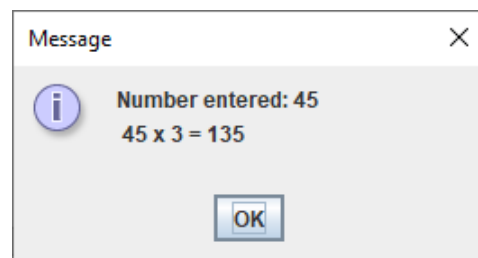
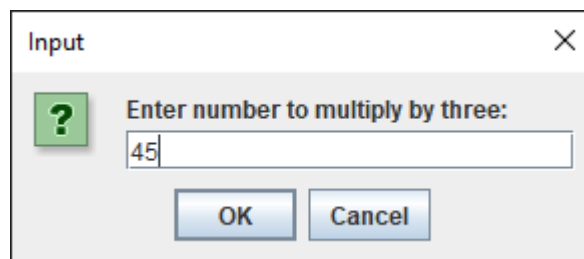
Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Employee grade (A, B or C):", a text input field containing "C", and "OK" and "Cancel" buttons.



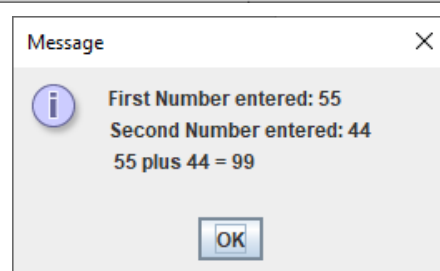
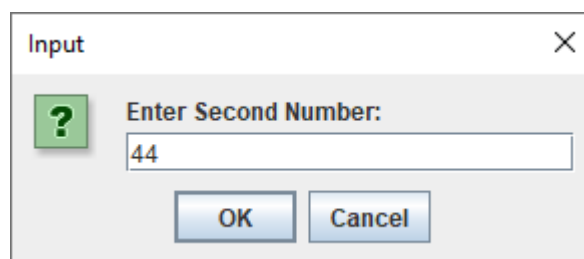
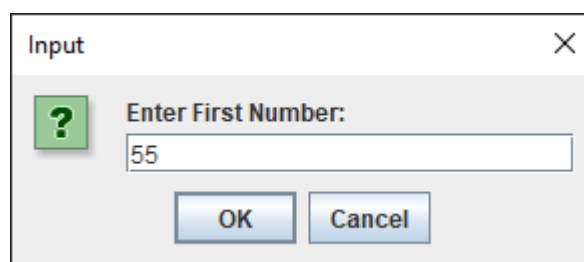
## Exercise 8

**Goal: Create a program in Java that allows for input using a window**

Create a new a Java program that prompts the user for an integer number and triples it. Your output should be similar to as shown below:



Amend the program so that the user can enter 2 numbers, and the numbers are added:

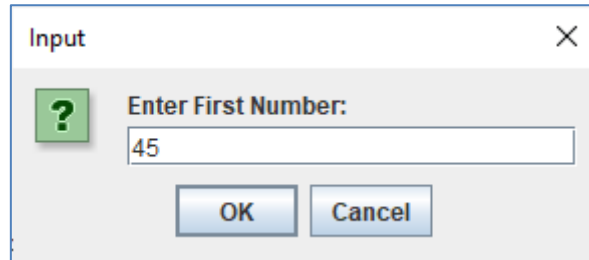




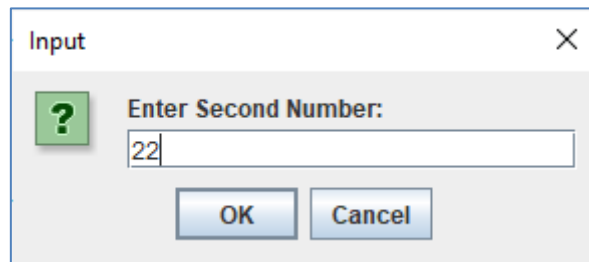
## Exercise 9

**Goal: Create a calculator program in Java that performs operations on numbers entered**

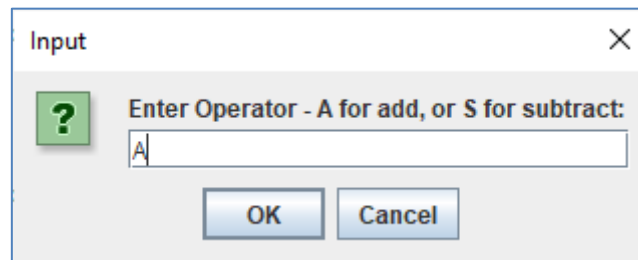
Create a new a Java program that allows the user to enter two integer numbers. The user is then prompted to specify an operator (A for add, S for subtract, M for multiply, D for divide). Your output should be similar toas shown below:



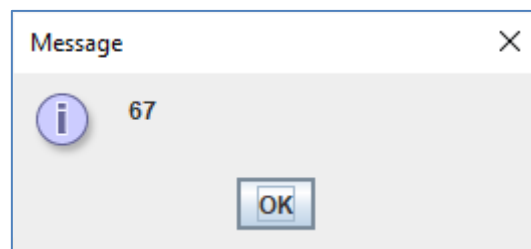
Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter First Number:", a text input field containing "45", and "OK" and "Cancel" buttons.



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Second Number:", a text input field containing "22", and "OK" and "Cancel" buttons.



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Operator - A for add, or S for subtract:", a text input field containing "A", and "OK" and "Cancel" buttons.



Message dialog box titled "Message" with a close button (X). It contains a blue information icon (i), the text "67", and an "OK" button.

## Exercise 10

**Goal: Create a calculator program in Java that performs operations on numbers entered**

Create a new a Java program that allows the user to enter two double numbers. The user is then prompted to specify an operator (A for add, S for subtract, M for multiply, D for divide). Your output should be similar toas shown below:

The image displays four sequential Java Swing dialog boxes:

- Input Dialog 1:** Titled "Input", it contains a green question mark icon, the label "Enter First Number:", a text field with "76", and "OK" and "Cancel" buttons.
- Input Dialog 2:** Titled "Input", it contains a green question mark icon, the label "Enter Second Number:", a text field with "23", and "OK" and "Cancel" buttons.
- Input Dialog 3:** Titled "Input", it contains a green question mark icon, the label "Enter Operator (A, S, D or M):", a text field with "A", and "OK" and "Cancel" buttons.
- Message Dialog:** Titled "Message", it contains a blue information icon, the text "First Number entered: 76.0", "Second Number entered: 23.0", and "76.0 plus 23.0 = 99.0", with an "OK" button.

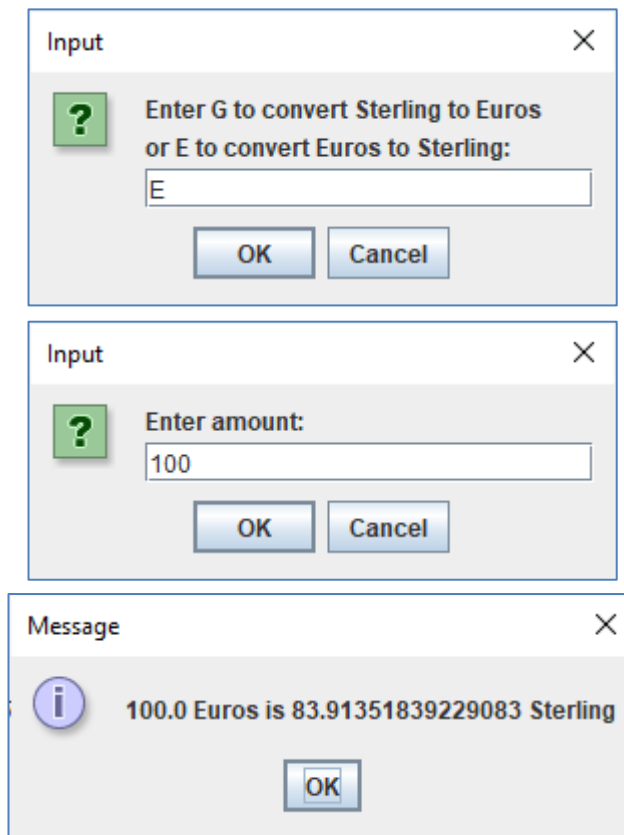
Amend your program so that the program loops at the end of each calculation, asking the user for another 2 numbers, and performing another calculation if required. The program ends when the user enters the word "Exit", as shown below:

The image shows a single Java Swing dialog box titled "Input". It contains a green question mark icon, the label "Enter Operator (A, S, D or M - or type Exit to end):", a text field with "Exit", and "OK" and "Cancel" buttons.

# Exercise 11

## Goal: Create a currency convertor program in java

Create a new a Java program that will allow the user to convert Sterling to Euros, and Euros to Sterling. The user should be prompted to enter G to convert Sterling to Euros, or E to convert Euros to Sterling. Then they should be prompted for the amount. Finally, the conversion is output as a message dialog. Your output should be similar to as shown below:



Assume the conversion rate is as follows:

1 Euro = 0.8391 Sterling

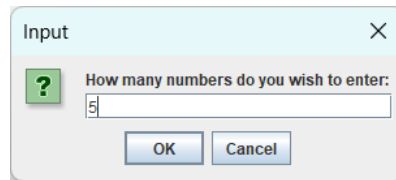
1 Sterling = 1.1917 Euros

## Exercise 12

**Goal: Create a program in Java give the average of a series of numbers entered**

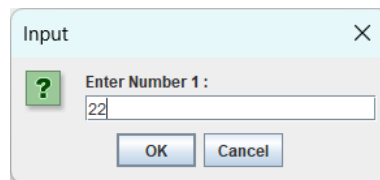
This program will prompt the user to specify how many numbers will be entered, the user then enters a series of numbers. The program then displays the average of all the numbers input.

The program initially asks the user how many numbers they would like to enter:

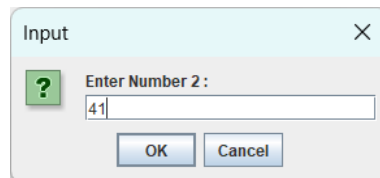


Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "How many numbers do you wish to enter:", a text input field containing the number "5", and "OK" and "Cancel" buttons.

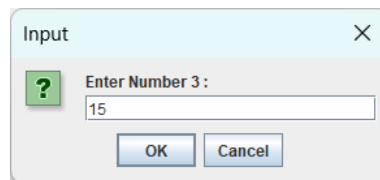
The user then enters numbers:



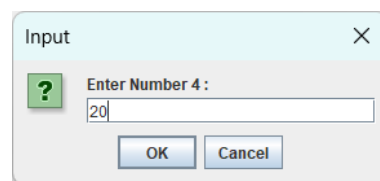
Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Number 1 :", a text input field containing the number "22", and "OK" and "Cancel" buttons.



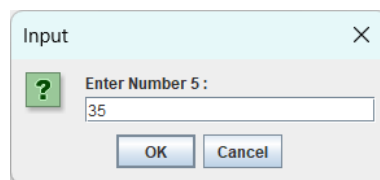
Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Number 2 :", a text input field containing the number "41", and "OK" and "Cancel" buttons.



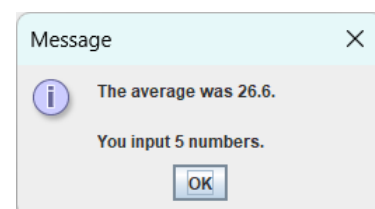
Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Number 3 :", a text input field containing the number "15", and "OK" and "Cancel" buttons.



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Number 4 :", a text input field containing the number "20", and "OK" and "Cancel" buttons.



Input dialog box titled "Input" with a close button (X). It contains a green question mark icon, the text "Enter Number 5 :", a text input field containing the number "35", and "OK" and "Cancel" buttons.

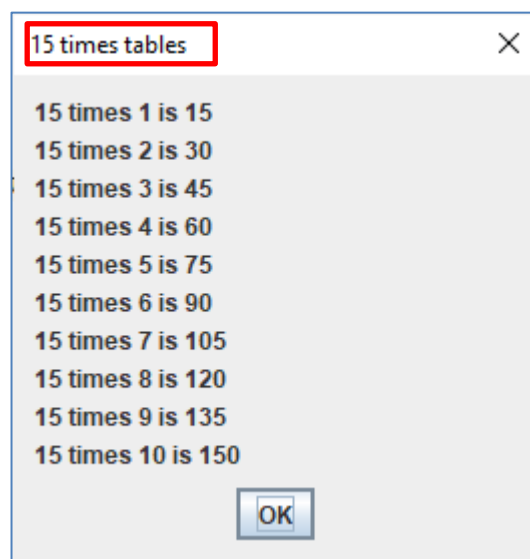
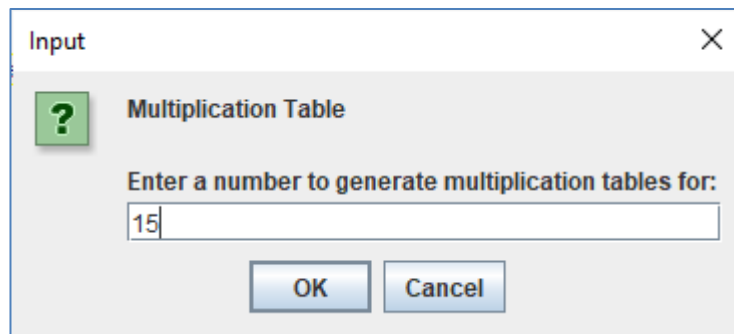


Message dialog box titled "Message" with a close button (X). It contains an information icon (i), the text "The average was 26.6.", the text "You input 5 numbers.", and an "OK" button.

## Exercise 13

### Goal: Create a program in java that will display multiplication tables

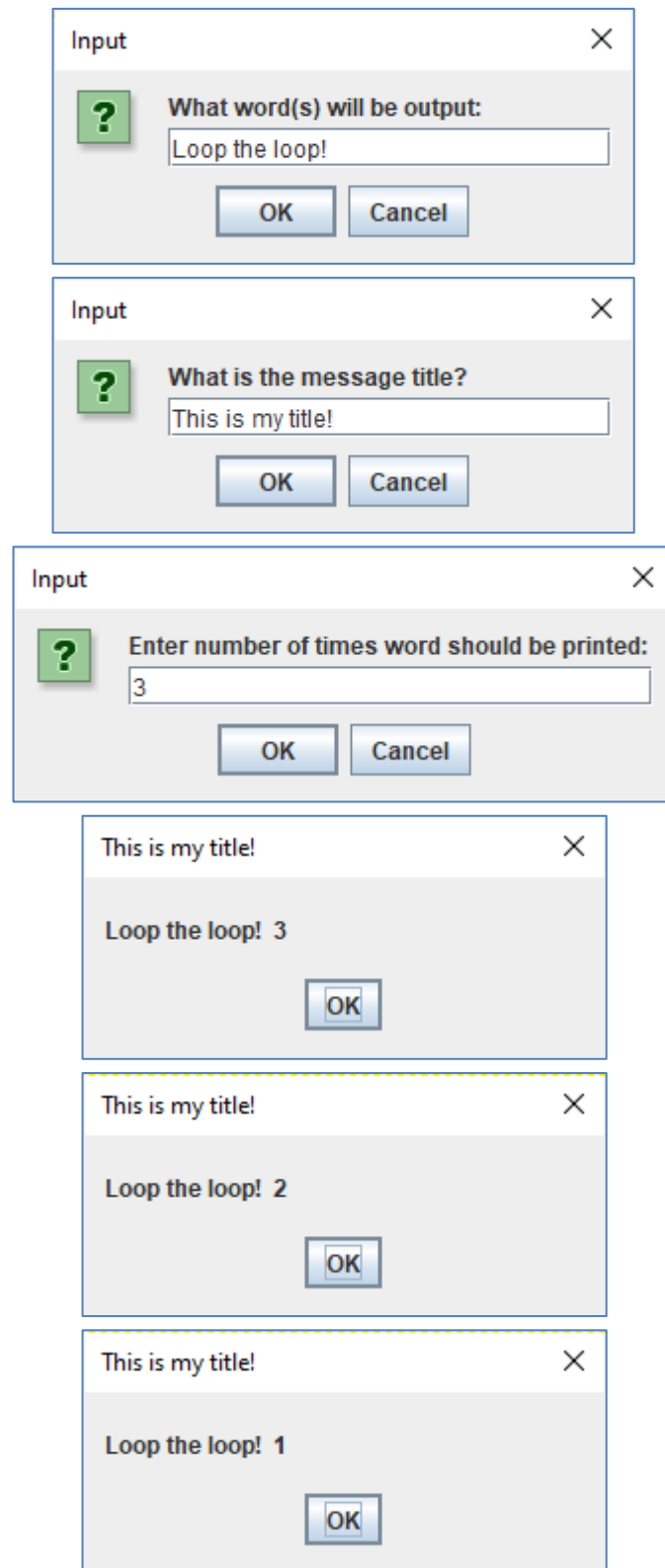
Create a new a Java program that will allow the user to input a value that will generate multiplication tables for that number. Your output should be similar to as shown below. Note that the window output by the loop should be a PLAIN\_MESSAGE dialog type, and the title of the output window should state "X times tables" – see red area below.



## Exercise 14

### Goal: Create a repeat loop program in java

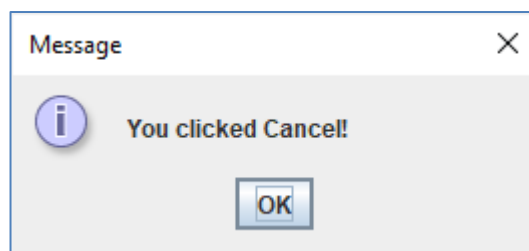
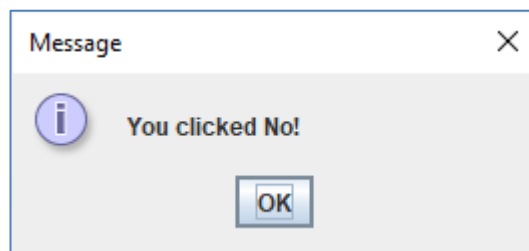
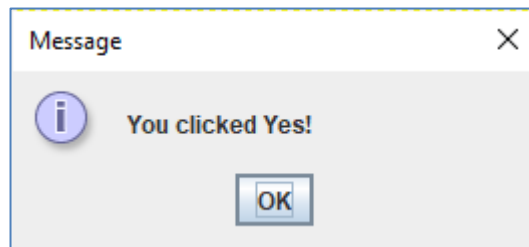
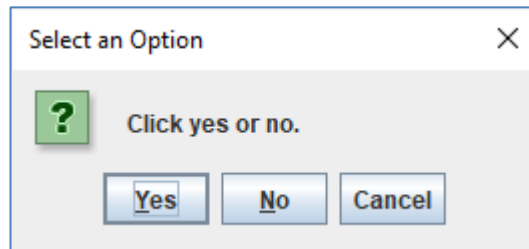
Create a new a Java program that will allow the user to input a value that will be repeated a number of times, as decided by the user also. Your output should be similar to as shown below. Note that the window output by the loop should be a PLAIN\_MESSAGE dialog type.



## Exercise 15

### Goal: Create a yes/no/cancel program in java

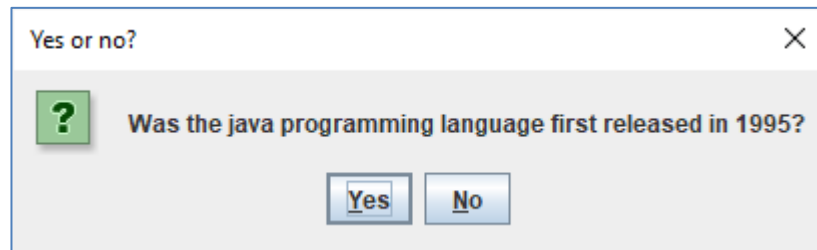
Create a new a Java program that uses a confirm (JOptionPane.showConfirmDialog) dialog window – prompting the user to click either yes, no, or cancel. What ever option the user clicks, a message should appear showing what option was chosen.



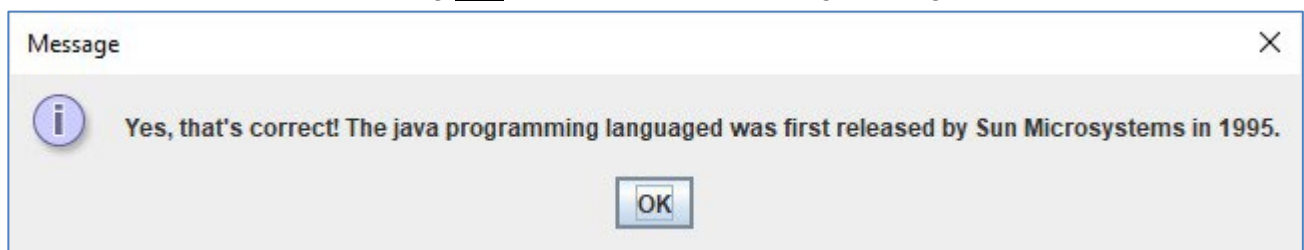
# Exercise 16

## Goal: Create a 1-question quiz program in java

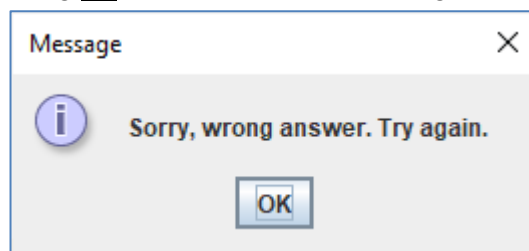
Create a new a Java program that uses a confirm (JOptionPane.showConfirmDialog) dialog window – prompting the user to click either yes or no only (there should be no cancel option). The user should be asked a question as follows:



Clicking **yes** will produce the following message:



Clicking **no** will produce the following message:

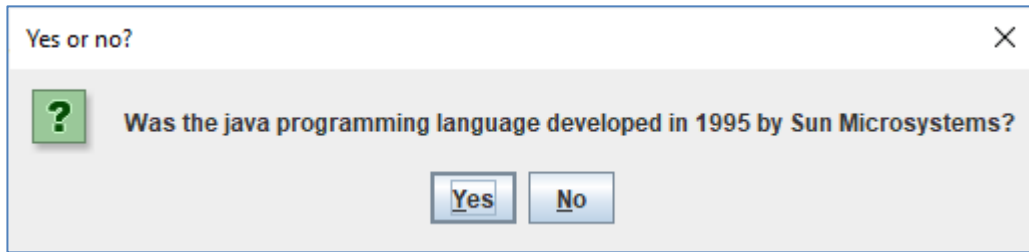




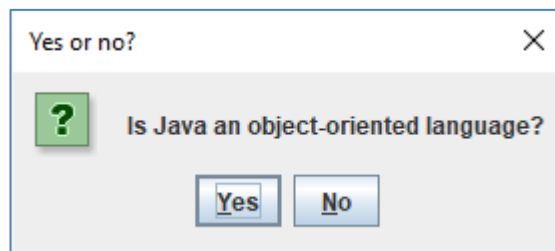
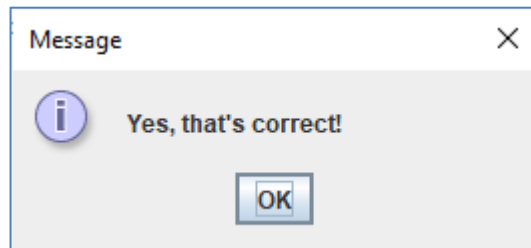
# Exercise 17

## Goal: Create a 3-question quiz program in java

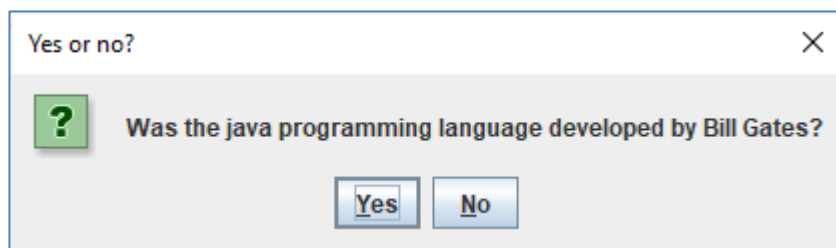
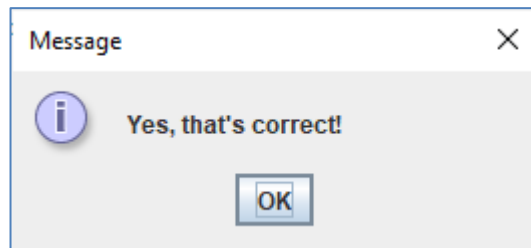
Create a new a Java program that uses a confirm (JOptionPane.showConfirmDialog) dialog window – prompting the user to click either yes or no only (there should be no cancel option). The user should be asked 3 different questions as follows:



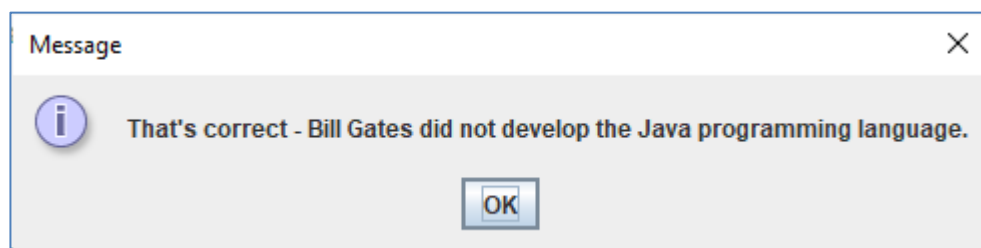
Correct answer, yes:



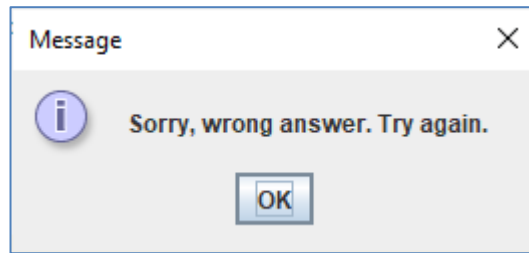
Correct answer, yes:



Correct answer, no:



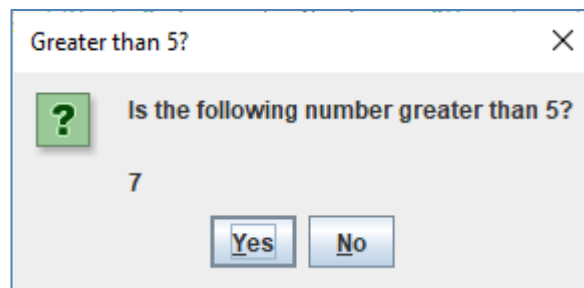
All wrong answers should display the following:



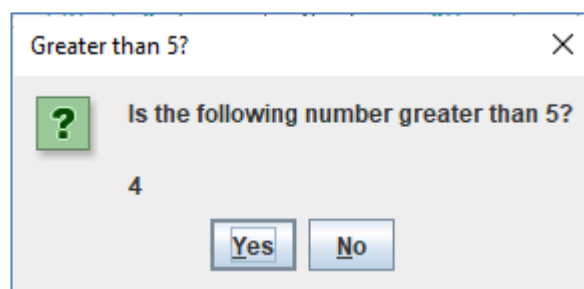
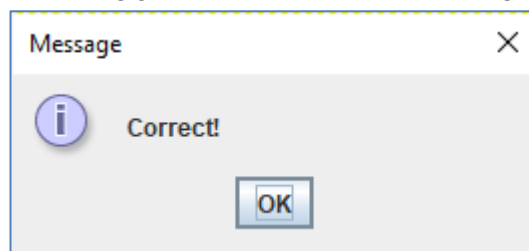
## Exercise 18

### Goal: Create a 1-question quiz program in java

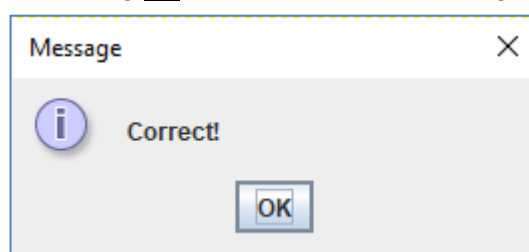
Create a new Java program that uses a confirm (`JOptionPane.showConfirmDialog`) dialog window – prompting the user to click either yes or no. The program should generate a random number between 1 and 10. Then the user will be prompted with the question, “Is the number greater than 5?” The program should display the correct message depending on the random number generated, eg:



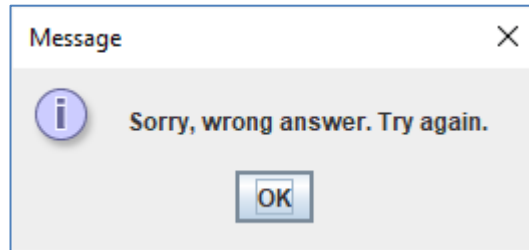
Clicking **yes** will produce the following:



Clicking **no** will produce the following:



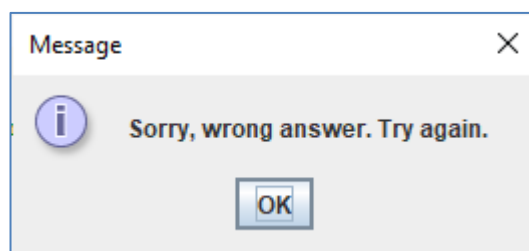
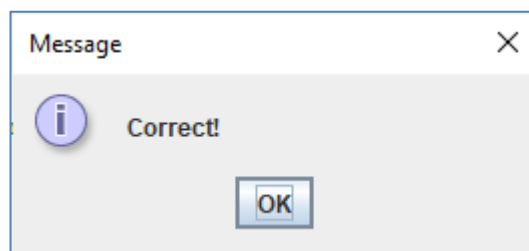
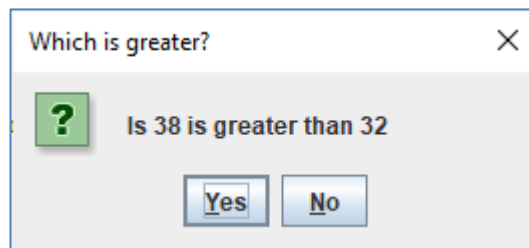
Any wrong answers should produce the following output:



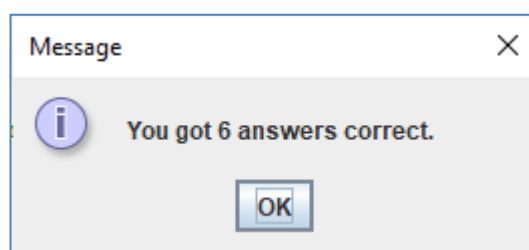
## Exercise 19

### Goal: Create a 10-question quiz program in java

Create a new Java program that uses a confirm (`JOptionPane.showConfirmDialog`) dialog window – prompting the user to click either yes or no. The program should generate 2 random numbers, both between 1 and 100. Then the user will be prompted with a question asking if the first number greater than the second number (see example output below).



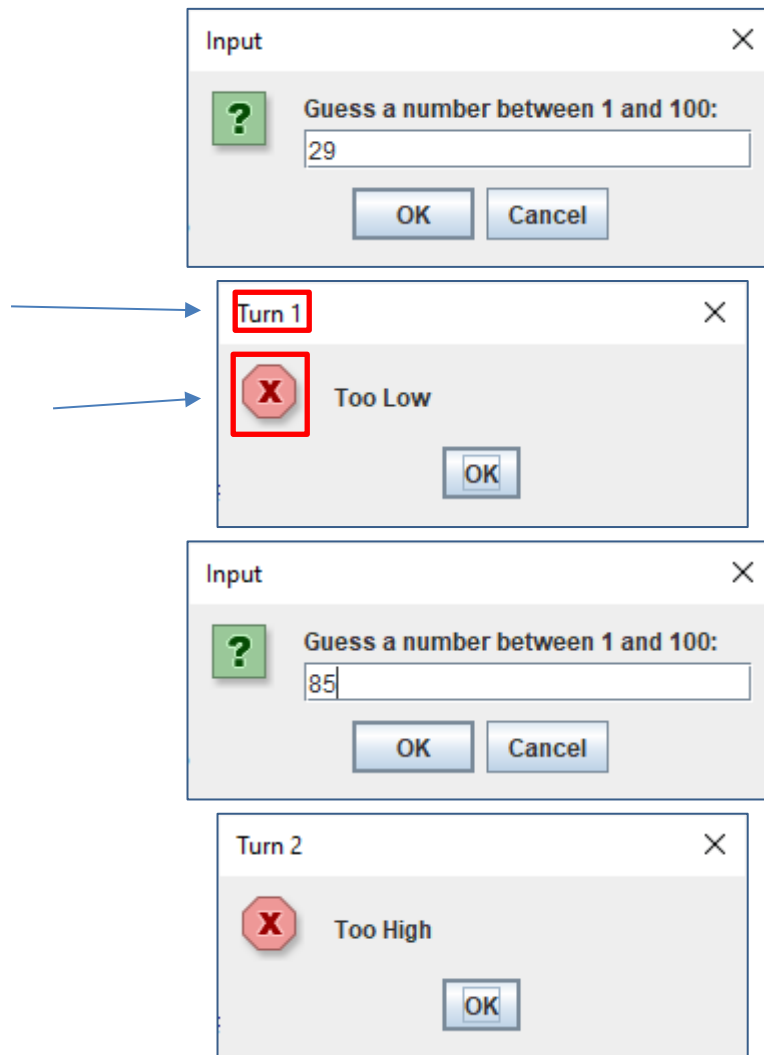
The program should loop 10 times using a for loop (with a different set of random numbers each time). At the end of the program, a message showing the correct number of answers selected:



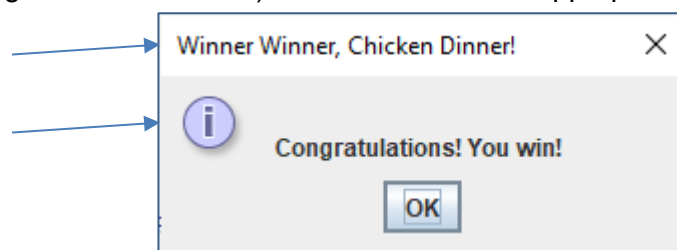
## Exercise 20

### Goal: Create a guessing game in java

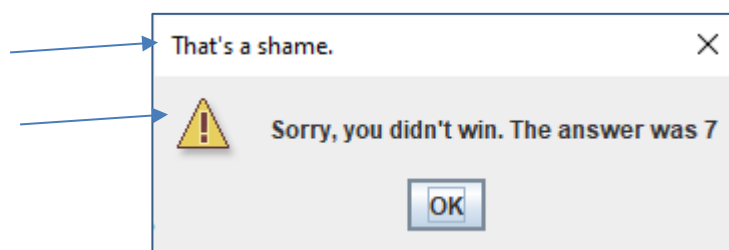
Create a guessing game in Java that will generate a random number between 1 and 100. The user has six attempts to guess the number.



On each guess, the user should be notified on whether it is too high or too low. The windows displaying guesses that are too high or too low should show how many turns the user has had, along with the error icon in the window (see page 230 of the notes). If the user wins, an appropriate message is displayed:



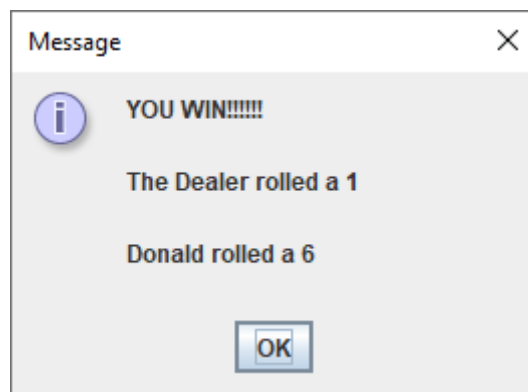
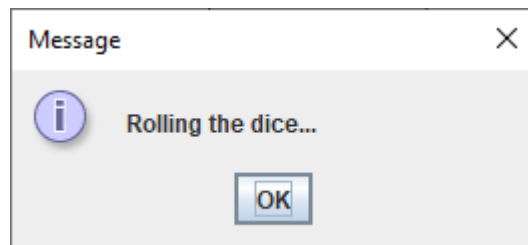
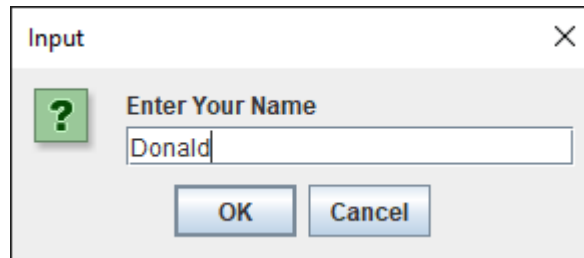
If the user does not win, they get a suitable message, with the warning icon as shown.



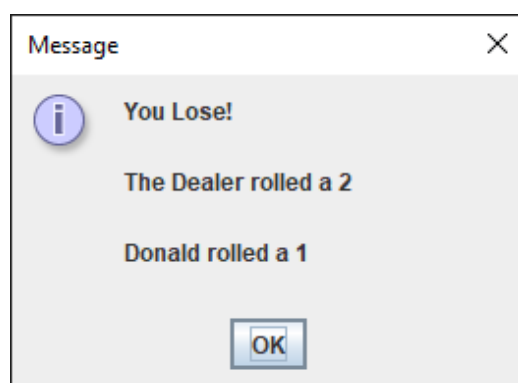
# Exercise 21

## Goal: Create a dice game in Java

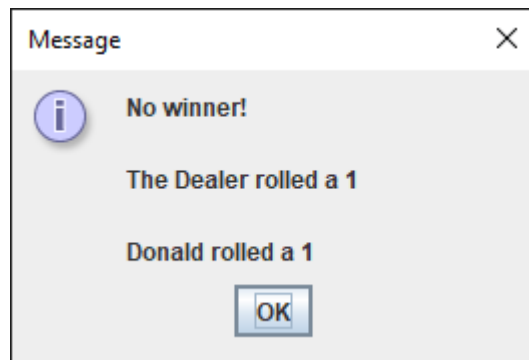
Create a new a Java program that prompts the player to enter their name. A dice is then rolled for the player and for the dealer - This can be achieved by generating a random number between one and six for both the player and the dealer. The winner is whoever has the highest number.



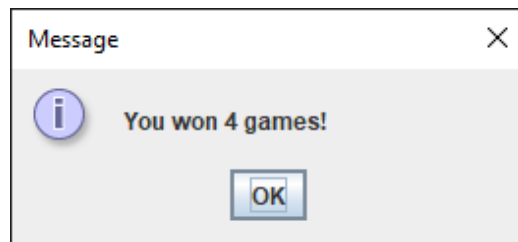
Or



If both players roll the same number, then the following is output:



Amend your code that the game runs 10 times (using a **for** loop). At the end of the 10<sup>th</sup> game, a window should be displayed showing the player how many games they won:

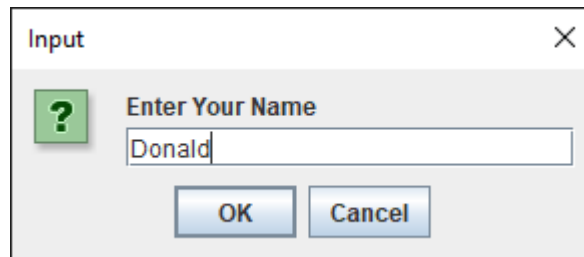


## Exercise 22

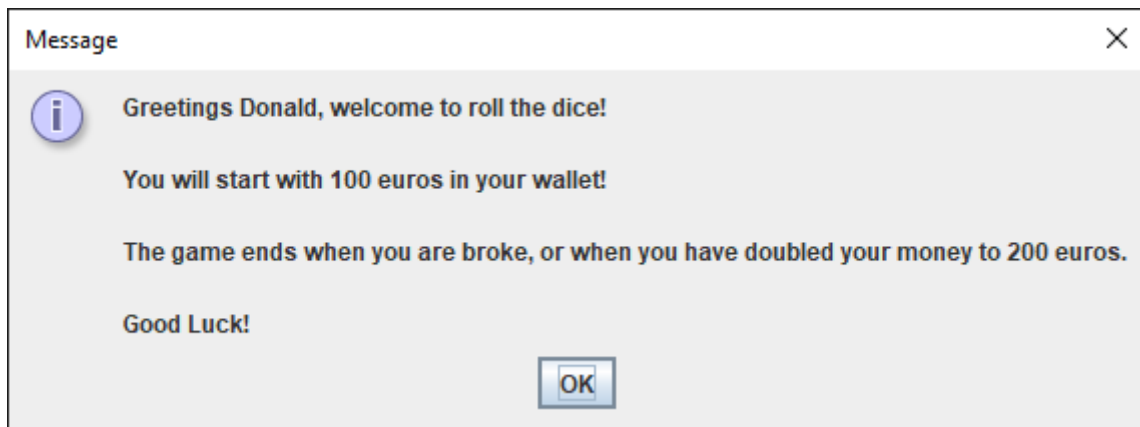
### Goal: Create a dice game in Java

Amend your game from the previous exercise, so that you can bet on each roll of the dice. You will begin with 100 Euros, and the game will end only when all your money is gone, or when you have doubled your money to 200 Euros, or after 10 turns.

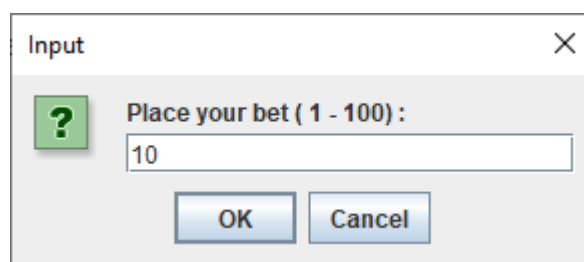
The game will now start with the following:



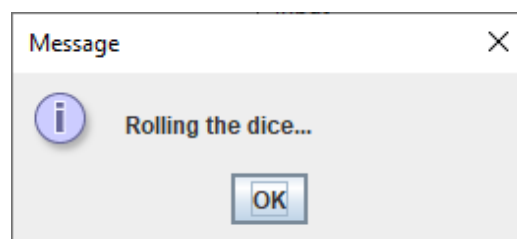
An input dialog box titled "Input" with a close button (X) in the top right corner. It features a green question mark icon on the left. The main text is "Enter Your Name". Below this is a text input field containing the name "Donald". At the bottom, there are two buttons: "OK" and "Cancel".



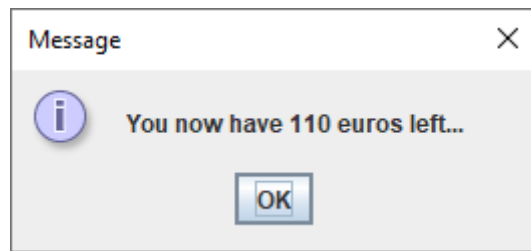
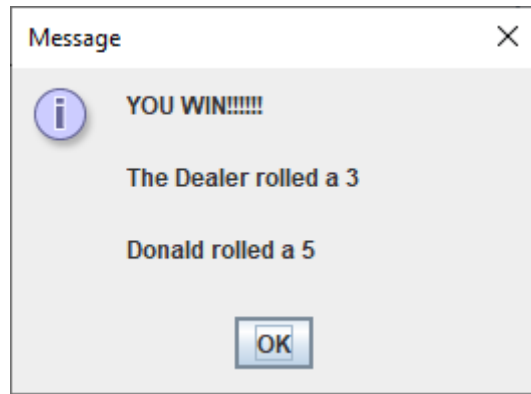
A message dialog box titled "Message" with a close button (X) in the top right corner. It features a purple information icon (i) on the left. The text inside reads: "Greetings Donald, welcome to roll the dice!", "You will start with 100 euros in your wallet!", "The game ends when you are broke, or when you have doubled your money to 200 euros.", and "Good Luck!". At the bottom, there is an "OK" button.



An input dialog box titled "Input" with a close button (X) in the top right corner. It features a green question mark icon on the left. The main text is "Place your bet ( 1 - 100) :". Below this is a text input field containing the number "10". At the bottom, there are two buttons: "OK" and "Cancel".



A message dialog box titled "Message" with a close button (X) in the top right corner. It features a purple information icon (i) on the left. The text inside reads: "Rolling the dice...". At the bottom, there is an "OK" button.



The game continues (loops) to allow bets to be placed while cash is greater than zero or less than 200

