Revision labs

Objective

In this series of labs, you will:

- create a program to practise many of the pre-course studies.

Lab01 – Make a start!

Eclipse is the development tool used by many Java developers and throughout this course. This lab will show you how to create and run a Java program.

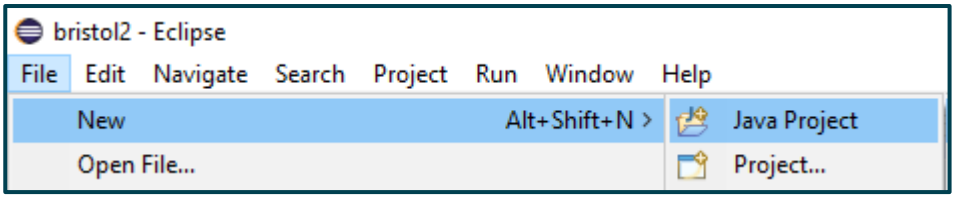
Duration

Five minutes

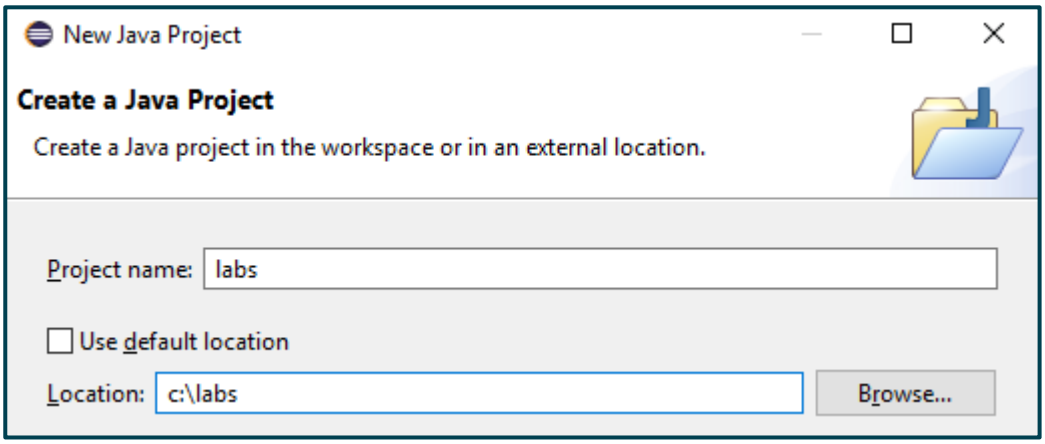
Step by step

Creating a new Java application

1. Launch Eclipse and type **C:\Labs** as the location for your 'workspace'.
2. Dismiss the Welcome window.
3. Choose the following menus:

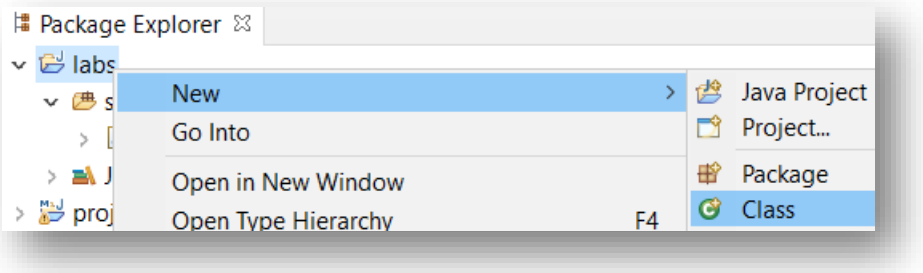


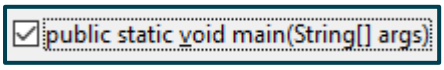
4. Type the following project name and location and then accept the other default settings:



5. Select **Finish**.

6. Right-click on the **labs** folder in your project explorer and create a new class called **Program**.



And make sure you select: 

Writing the code

1. In the Program class's **main** method, type '**syso**' and then hit **Ctrl-Space.**
   The first entry in the context menu will type **`System.out.println`**.

```
public static void main(String[] args) {
    System.out.println("Hello, world!");
}
```

2. Press **Ctrl-Shift-f** (together) to format your code.

Building and running the program

3. Press **Ctrl+F11** to run the program or select the green **Run** icon.

Lab 02 – Creating methods

1. Add a new method as
   public static int getInt(**String** prompt)

   This method displays a prompt (String prompt) and then gets an integer input from the user and returns it as an **int**.

   Use the Scanner object as:

   ```
   Scanner s = new Scanner(System.in);

   return s.nextInt();
   ```

   The Scanner class has to be resolved. Select the word **Scanner** and press Ctrl-1 and choose **import Scanner**.

2. Create another method called **String getString**(**String** prompt)
   Use the `s.nextLine();` to get a String.

3. Call both methods in the **main()** method (see lab01):

   a. Ask user for their name and age.

   b. Display a message that includes their name and age+1 like:
   (if Bob is 20 years old).

   Dear **Bob** next year you will be **21** years old.

Move your code to a separate class

Does every method have to be in the Program class?
In this part you'll create a new class and move all the code to that class.

1. Create a new Class called **Utils** without a main() method.
2. Transfer the coed for the **getInt** and **getString** methods to the **Utils** class.
3. Remove the **static** word from every method definition.
   We'll discuss **static** method later. The only reason why every method was static was because the method main() in the Program class was a **static** method, but we are now free of static main()!
4. At the start of the **main**() method, create an instance of the ***Utils*** class

   Utils **utils** = **new** ***Utils***();
5. At the start of each method call (in main) add "**utils**". For example:
   instead of `getInt()` `type` **utils**`.getInt()`
6. Run the application to make sure everything works.

Lab 03 – Practice IF statements

In this part you will calculate the amount of life insurance.

Step by step

Create a new Class called **LifeInsurance** in a package called **exercise1.**

Create a new method in this class called **calculate** (no parameters needed)
Your main() method in lab 01 will call the calculate method like:

```
import exercise1.LifeInsurance;

public class Program {

  public static void main(String[] args) {
     LifeInsurance life = new LifeInsurance();
     System.out.println(life.calculate());
  }
}
```

Calculating life insurance depends on many factors but for simplicity:

- get the customer's **name** and **age**
  We only consider ages between 18 and 85 (inclusive).
  Please show a suitable message if age is not within the range and return **-1**.
- get the number of years the user wishes to keep the life insurance running.
  The duration must be between **10 and 25** (inclusive)
  People over 70 years of age can get a maximum of 15 years of life insurance. (**70+15=85** which is the maximum age we consider).
- ask the user for their occupation.
  Apply a **10%** discount if they are a nurse, doctor, teacher or a police officer.
- apply a formula like:
  Minimum payment of £5 + Age + (Term/10)
  Apply any discount and then display the result.

Lab 04 – Practise an Iteration statement (loops)

In this part you will calculate the amount of life insurance.

Step by step

Create a **for loop** in the main() method of the Program class in lab01 to execute the line

```
System.out.println(life.calculate());
```

three times.

Replace the **for loop** with a **while loop**.

Test your code to make sure it works.

Within the while loop, ask the user if they would like to calculate another quote and break out of the loop if they say No!