Object-Oriented Language and Theory

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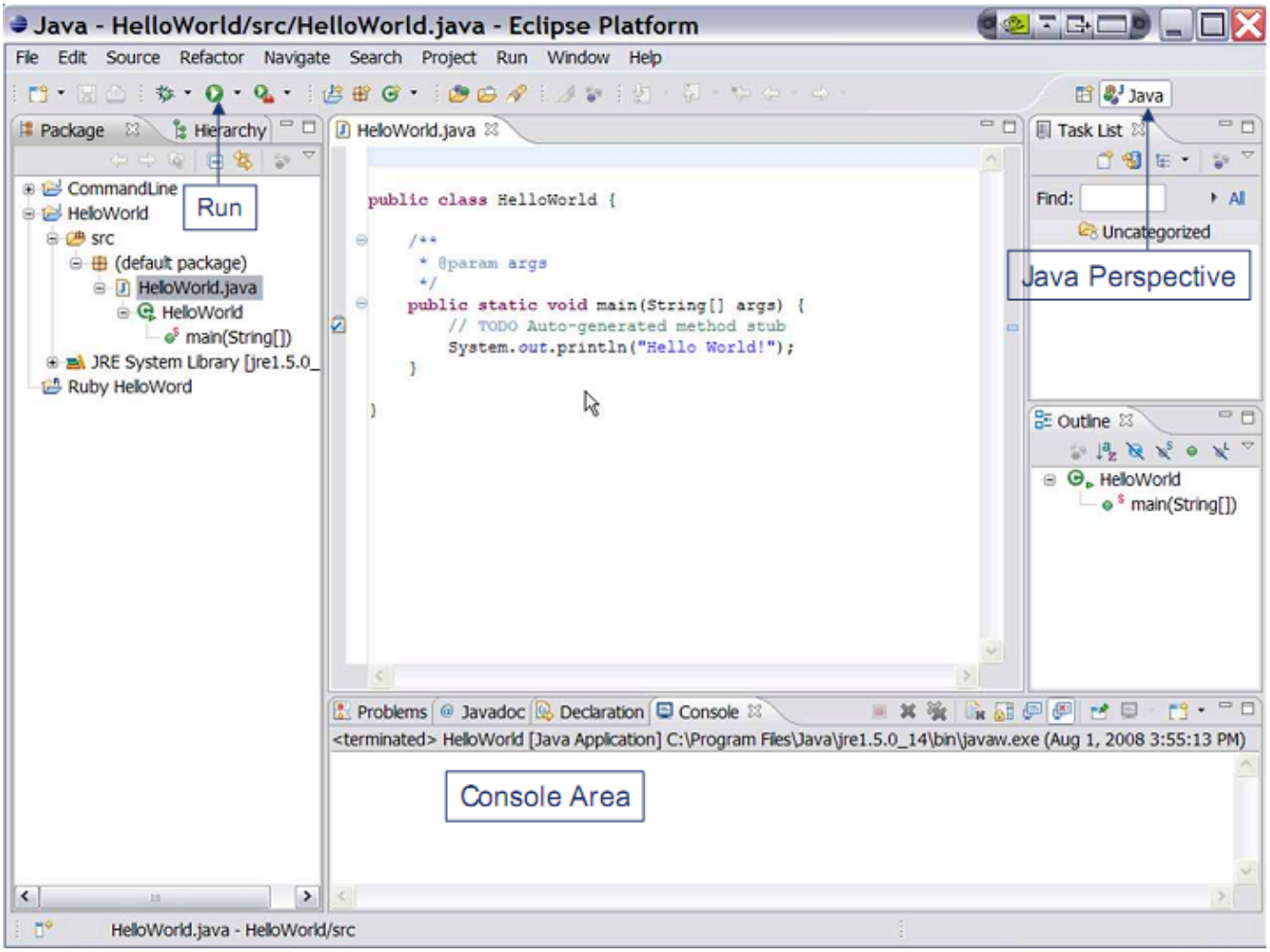
Lab 2: Java basics and UML

* Introduction to Eclipse / Netbean



* Javadocs help:

- Open index.html in the docs folder
- Click the link API & Language on the top
- Click the link Java 2 Platform API Specification
- The top left frame: all packages in Java API
- The bottom left frame: corresponding classes in the chosen above package
- The right frame: Detail information
- Click to a frame, and find the necessary information (Ctrl + F)

1. Write, compile and run the ChoosingOption program:

```
1  import javax.swing.JOptionPane;
2  public class ChoosingOption{
3    public static void main(String[] args){
4      int option = JOptionPane.showConfirmDialog(null,
5                  "Do you want to change to the first class ticket?");
6
7      JOptionPane.showMessageDialog(null,"You've chosen: "
8                      + (option==JOptionPane.YES_OPTION?"Yes":"No"));
9      System.exit(0);
10   }
11 }
```

Questions:

- What happens if users choose “Cancel”?
- How to customize the options to users, e.g. only two options: “Yes” and “No”, OR “I do” and “I don’t” (Suggestion: Use Javadocs or using Eclipse/Netbean IDE help).

2. Write a program for input/output from keyboard

```
1  import java.util.Scanner;
2  public class InputFromKeyboard{
3      public static void main(String args[]){
4          Scanner keyboard = new Scanner(System.in);
5
6          System.out.println("What's your name?");
7          String strName = keyboard.nextLine();
8          System.out.println("How old are you?");
9          int iAge = keyboard.nextInt();
10         System.out.println("How tall are you (m)?");
11         double dHeight = keyboard.nextDouble();
12
13         //similar to other data types
14         //nextByte(), nextShort(), nextLong()
15         //nextFloat(), nextBoolean()
16
17         System.out.println("Mrs/Ms. " + strName + ", " + iAge + " years old. "
18                             + "Your height is " + dHeight + ".");
19
20     }
21 }
```

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```
<terminated> InputFromKeyboard [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_171.jdk/Contents/Home/bin/
What's your name?
Trang
How old are you?
35
How tall are you (m)?
1.65
Mrs/Ms. Trang, 35 years old. Your height is 1.65.
```

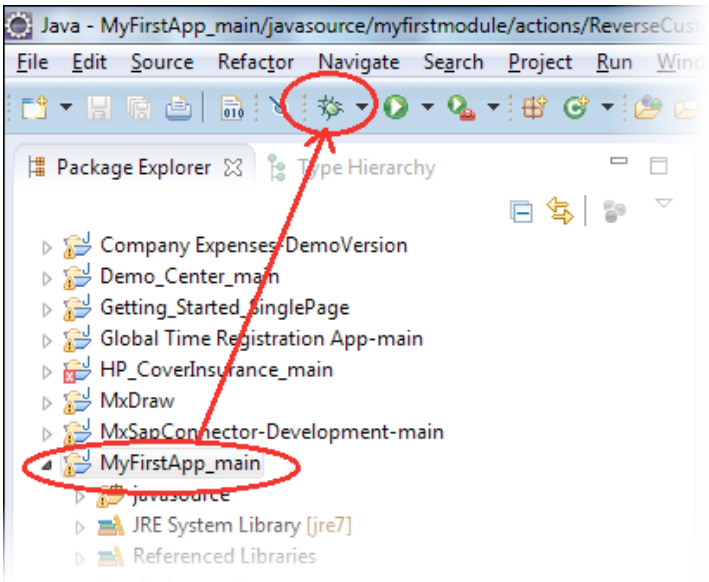
3. Use debug to run step by step or go to a checkpoint in a program

3.1. Setting breakpoints: Place the cursor on the line that needs debugging, hold down Ctrl+Shift, and press B to enable a breakpoint. A blue dot in front of the line will appear.

```
@Override
public String executeAction() throws Exception
{
    this.inputCustomer = __inputCustomer == null ? null : myfirstmodule.proxies.Customer.initialize(getContext(), __inputCustomer);

    // BEGIN USER CODE
    String customerName = this.inputCustomer.getName(this.getContext());
    return new StringBuilder(customerName).reverse().toString();
    // END USER CODE
}
```

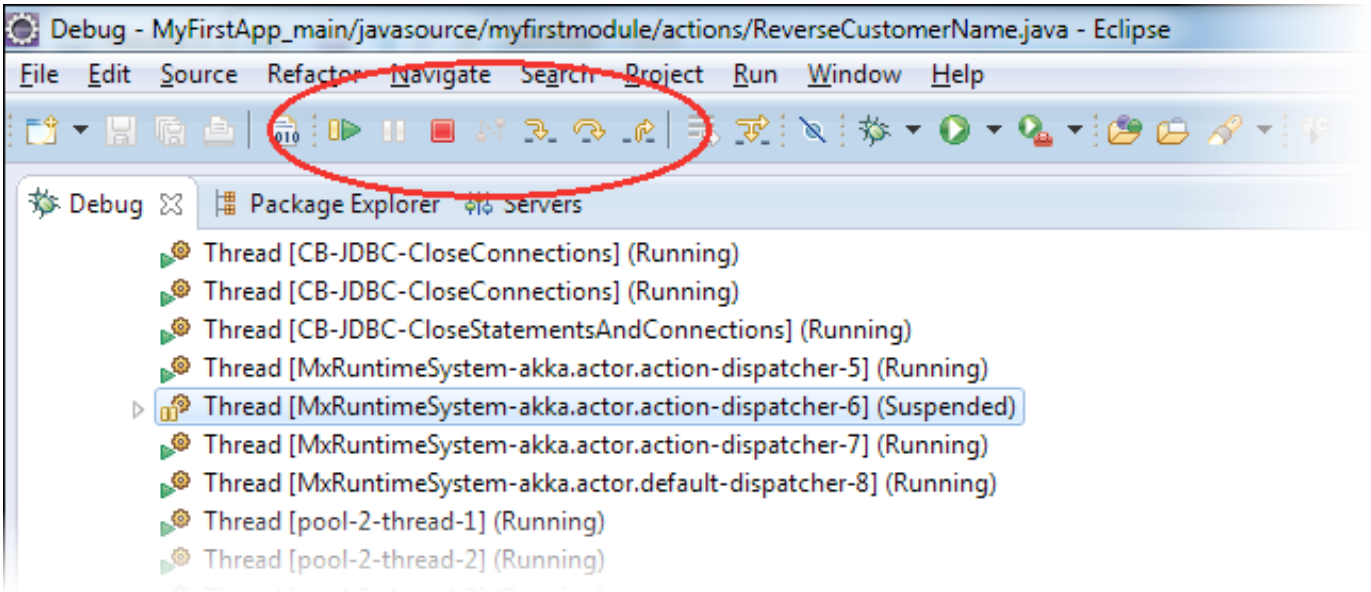
3.2. Debugging in Eclipse: Select the project root node in the package explorer and click the debug icon in the Eclipse toolbar. The application will now be started with Eclipse attached as debugger.



- As soon as the deployment process is ready, open the application in your browser and trigger the Java action:
    - As an end-user of the application, you will see a progress bar on your application
    - As a developer, you will see the Eclipse icon flashing on the Windows task bar
- Open Eclipse. You should now see the “debug” perspective of Eclipse.

3.3. Step into or Step over or Step return/Resume

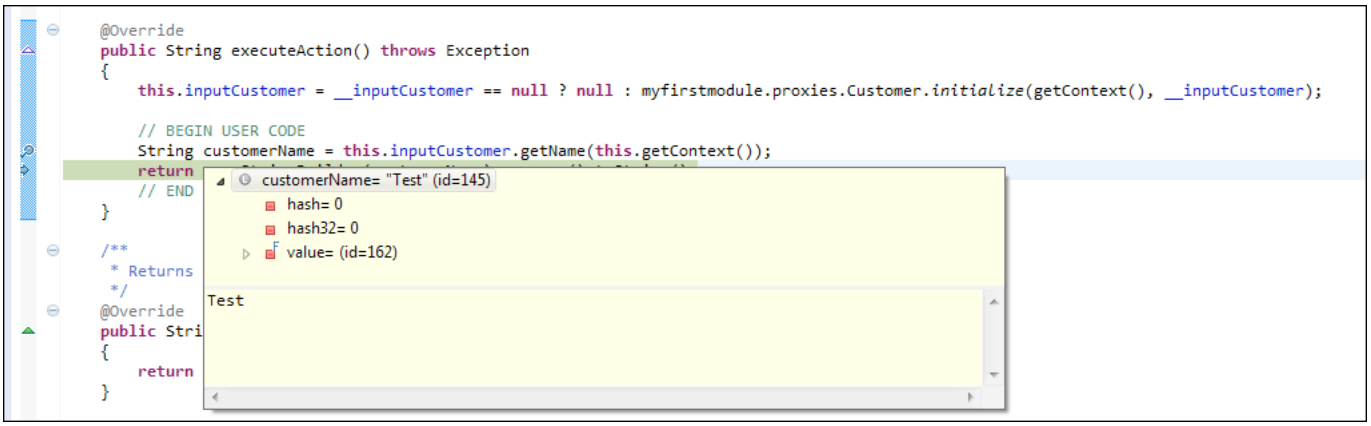
- Click Step into (or press F5) or Step over (or press F6) to move on the next step in the microflow.



- With debugger options, the difference between "Step into" and "Step over" is only noticeable if you run into a function call :
    - "Step into" (F5) means that the debugger steps into the function
    - "Step over" (F6) just moves the debugger to the next line in the same Java action
- With "Step Return" (pressing F7), you can instruct the debugger to leave the function; this is basically the opposite of "Step into."
- Clicking "Resume" (F8) instructs the debugger to continue until it reaches another breakpoint.

3.4. Popup window

Place your cursor on any of the variables in the Java action to see its value in a pop-up window.



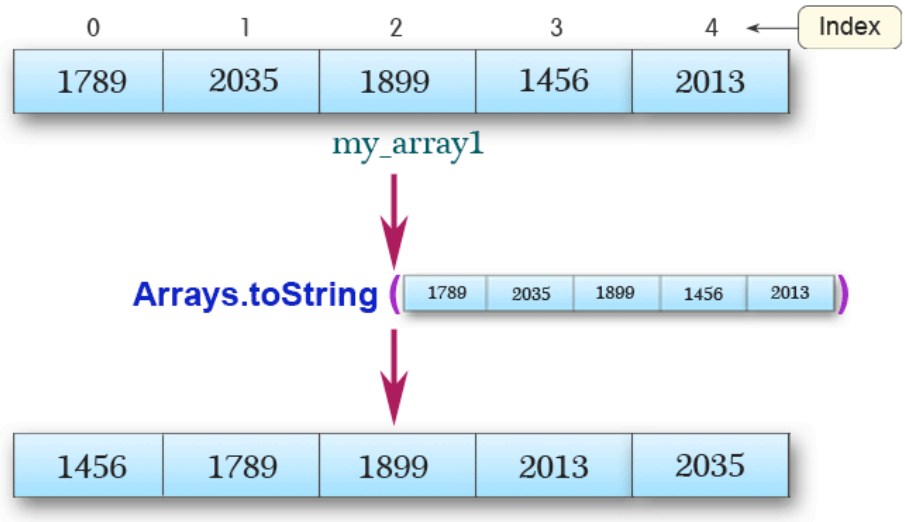
4. Write a program to display a triangle with a height of n stars (*), n is entered by users.

E.g. n=5:

```
    *
   ***
  *****
 *******
*********
```

5. Write a program to display the number of days of a month, which is entered by users (both month and year). If it is an invalid month/year, ask the user to enter again.

6. Write a Java program to sort a numeric array, and calculate the sum and average value of array elements.



7. Write a Java program to add two matrices of same size.