Practicum Report

Job sheet 4

Selection 1

Experiment

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CLASS 1I (INTERNATIONAL)

INFORMATICS ENGINEERING

INFORMATICS TECHNOLOGY

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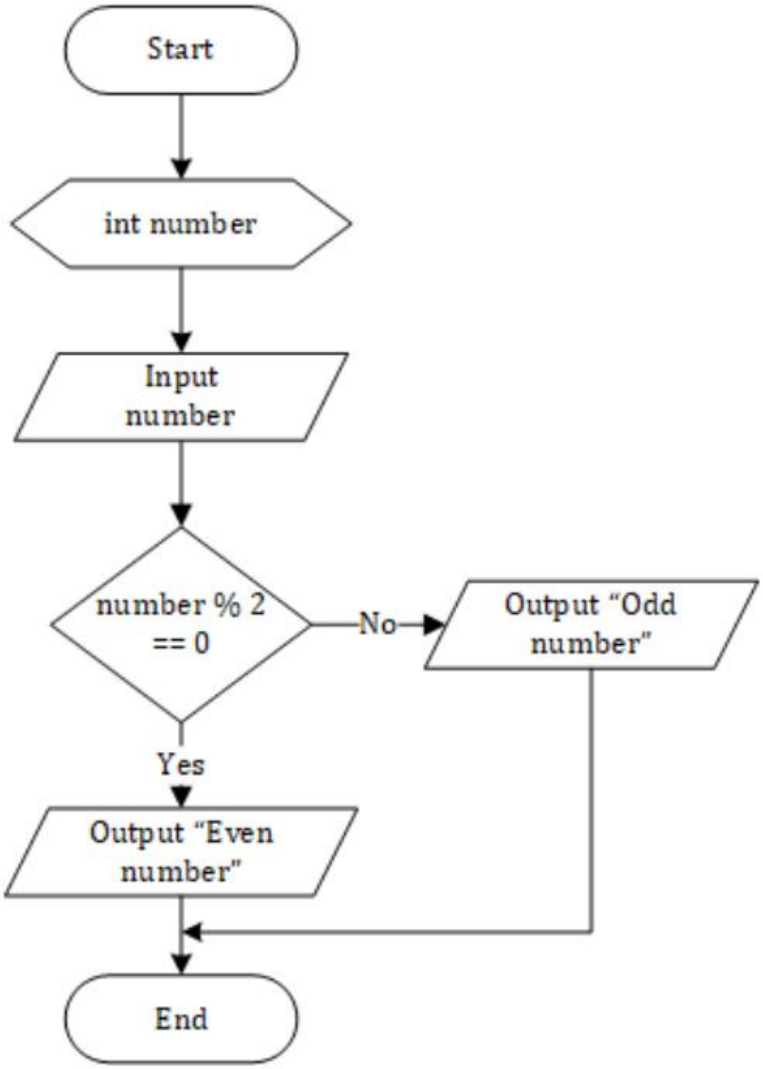
Contents

Laboratory Experiment

Experiment 1

1. Observe the flowchart!



The flowchart is used to determine odd or even numbers, then we will make the program based on the flowchart.

2. Open a text editor. Create a new file, name it **Selection1.java**

```
public class Selection1 {
```

3. Write the basic structure of the Java programming language which contains the **main()** function

```
public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
```

4. Add the **Scanner** library. Write the following code at the top **outside the class**

```
import java.util.Scanner;
```

5. Make a Scanner declaration. Write the following code in the main() function.

```
public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
```

6. Create an int variable with the name number

```
public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number;
```

7. Write down the syntax for entering the value from keyboard

```
public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number;
        System.out.print(s: "Enter a number: ");
        number = input.nextInt();
```

8. Create a selection structure to check whether the number is even or odd

```java
public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number;
        System.out.print(s: "Enter a number: ");
        number = input.nextInt();
        if (number % 2 == 0) {
            System.out.println(x: "Even Number");
        } else {
            System.out.println(x: "Odd Number");
```

9. Compile and run the program. Observe the results!

```java
import java.util.Scanner;

public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number;
        System.out.print(s: "Enter a number: ");
        number = input.nextInt();
        if (number % 2 == 0) {
            System.out.println(x: "Even Number");
        } else {
            System.out.println(x: "Odd Number");
        }
    }
}
```

```
Administrator: C:\WINDOWS\system32\cmd.exe

D:\Data\Daspro praktikum\java>javac Selection1.java

D:\Data\Daspro praktikum\java>java Selection1.java
Enter a number: 482612
Even Number

D:\Data\Daspro praktikum\java>
```

Questions!

1. Modify the program in its selection structure so that it becomes as follows:

```
String output = (number % 2 ==0) ? "Even Number!" : "Odd Number!";
System.out.println(output);
```

2. Compile, run, and observe the results!
3. Explain why the modified program output is the same as the program output before it was modified!

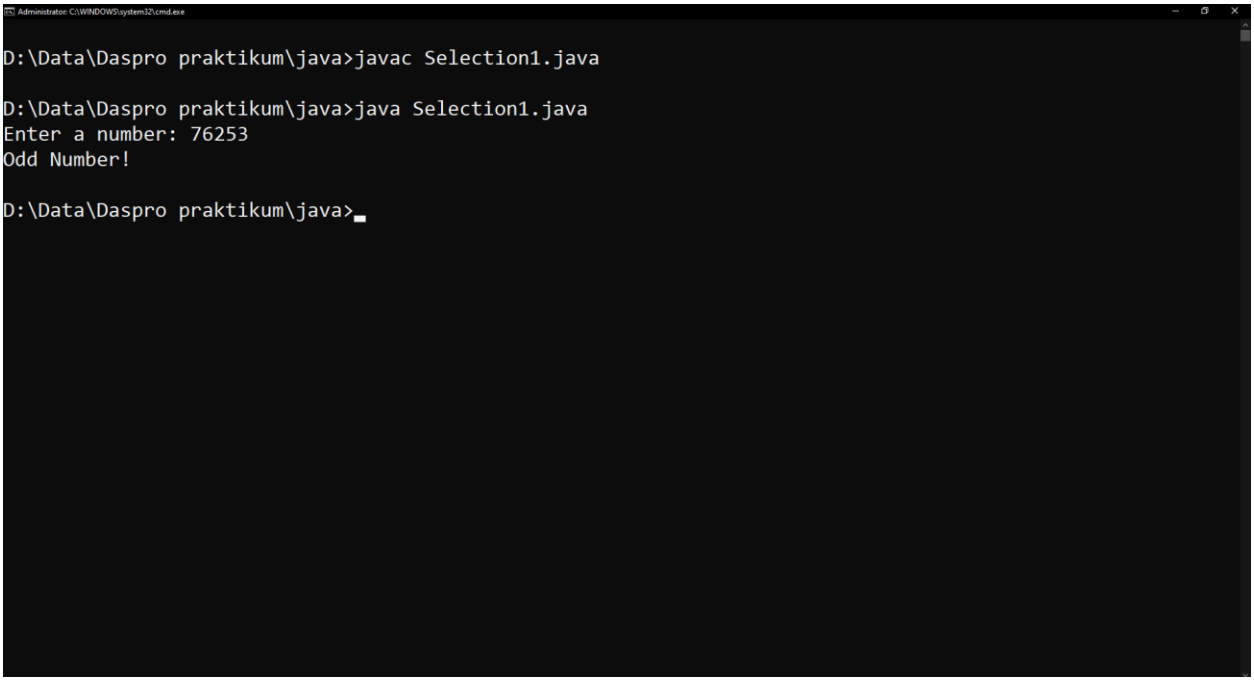
Answer!

1. _

```
import java.util.Scanner;

public class Selection1 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number;
        System.out.print(s: "Enter a number: ");
        number = input.nextInt();
        /*
        if (number % 2 == 0) {
            System.out.println("Even Number");
        } else {
            System.out.println("Odd Number");
        }
        */
        String output = (number % 2 ==0) ? "Even Number!" : "Odd Number!";
        System.out.println(output);
    }
}
```

2. _



3. Because the output variable is defined as Ternary Operators which used as a selection syntax.

Experiment 2

1. Open a text editor. Create a new file, name it Selection2.java

```
public class Selection2 {
```

2. Write the basic structure of the Java programming language which contains the main() function

```
public class Selection2 {
    Run | Debug
    public static void main(String[] args) {
```

3. Add the Scanner library. Write the following code at the top outside the class

```
import java.util.Scanner;
```

4. Make a Scanner declaration. Write the following code in the main() function

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

5. Create an int variable with the name score

```
int score;
```

6. Write down the syntax for entering the value from keyboard

```
System.out.print(s: "Enter a score: ");
score = input.nextInt();
```

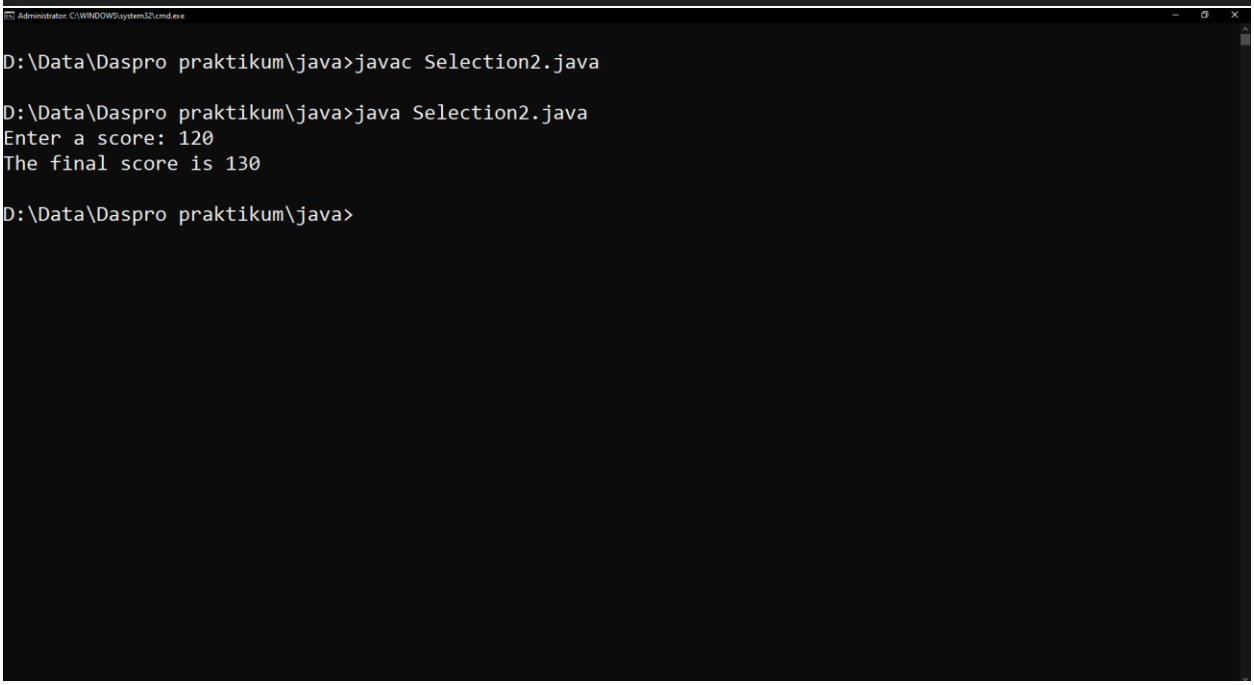
7.
8. Add the following selection structure

```
if (score >= 100) {
    score += 10;
} else {
    score -= 10;
}
System.out.println("The final score is " + score);
```

9. Compile and run the program. Observe the results!

```java
import java.util.Scanner;

public class Selection2 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int score;
        System.out.print(s: "Enter a score: ");
        score = input.nextInt();
        if (score >= 100) {
            score += 10;
        } else {
            score -= 10;
        }
        System.out.println("The final score is " + score);
    }
}
```



Question!

1. Describe the function of the following program code:
   score += 10;
   score -= 10;
2. Modify the program so that only one input becomes two (for example: score1and score2). Then calculate the average of the two values, if the average value is more than equal to 100 then subtract 5, whereas if the average value is lessthan100 then it will be printed immediately!

Answer!

1. To add/subtract 10 from the initial score
2. _

```java
import java.util.Scanner;

public class Selection2 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int score1, score2, FinalScore;
        System.out.print(s: "Enter a score 1: ");
        score1 = input.nextInt();
        System.out.print(s: "Enter a score 2: ");
        score2 = input.nextInt();
        FinalScore = (score1 + score2) / 2;
        if (FinalScore >= 100) {
            FinalScore -= 5;
        }
        System.out.println("The final score is " + FinalScore);
    }
}
```

```
Administrator: C:\WINDOWS\system32\cmd.exe

D:\Data\Daspro praktikum\java>javac Selection2.java

D:\Data\Daspro praktikum\java>java Selection2.java
Enter a score 1: 110
Enter a score 2: 110
The final score is 105

D:\Data\Daspro praktikum\java>java Selection2.java
Enter a score 1: 95
Enter a score 2: 97
The final score is 96

D:\Data\Daspro praktikum\java>
```

Experiment 3

1. Open a text editor. Create a new file, name it Selection3.java

```
public class Selection3 {
```

2. Write the basic structure of the Java programming language which contains the main() function

```
public class Selection3 {
    Run | Debug
    public static void main(String[] args) {
```

3. Add the Scanner library. Write the following code at the top outside the class

```
import java.util.Scanner;
```

4. Make a Scanner declaration. Write the following code in the main() function

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

5. Create an int variable with the name age

```
        int age;
```

6. Write down the syntax for entering the value from keyboard

```
        System.out.print(s: "Enter your age: ");
        age = input.nextInt();
```

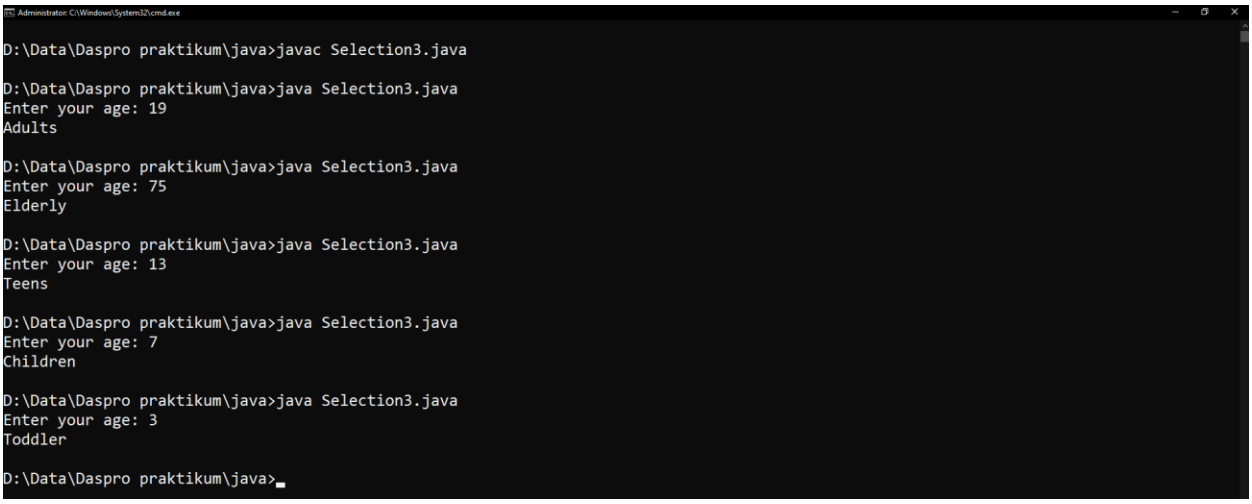
7. Add the following selection structure to check the age category

```
        if (age > 65) {
            System.out.println(x: "Elderly");
        } else if (age > 18) {
            System.out.println(x: "Adults");
        } else if (age > 12) {
            System.out.println(x: "Teens");
        } else if (age > 5) {
            System.out.println(x: "Children");
        } else {
            System.out.println(x: "Toddler");
        }
```

8. Compile and run the program. Observe the results!

```java
import java.util.Scanner;

public class Selection3 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int age;
        System.out.print(s: "Enter your age: ");
        age = input.nextInt();
        if (age > 65) {
            System.out.println(x: "Elderly");
        } else if (age > 18) {
            System.out.println(x: "Adults");
        } else if (age > 12) {
            System.out.println(x: "Teens");
        } else if (age > 5) {
            System.out.println(x: "Children");
        } else {
            System.out.println(x: "Toddler");
        }
    }
}
```



Question!

1. How many conditions exist in experiment 3? Mention what the conditions are!
2. Modify the program so that if the age entered is 0 years or less than 0 it will display the output "Sorry, the age you entered is wrong"!

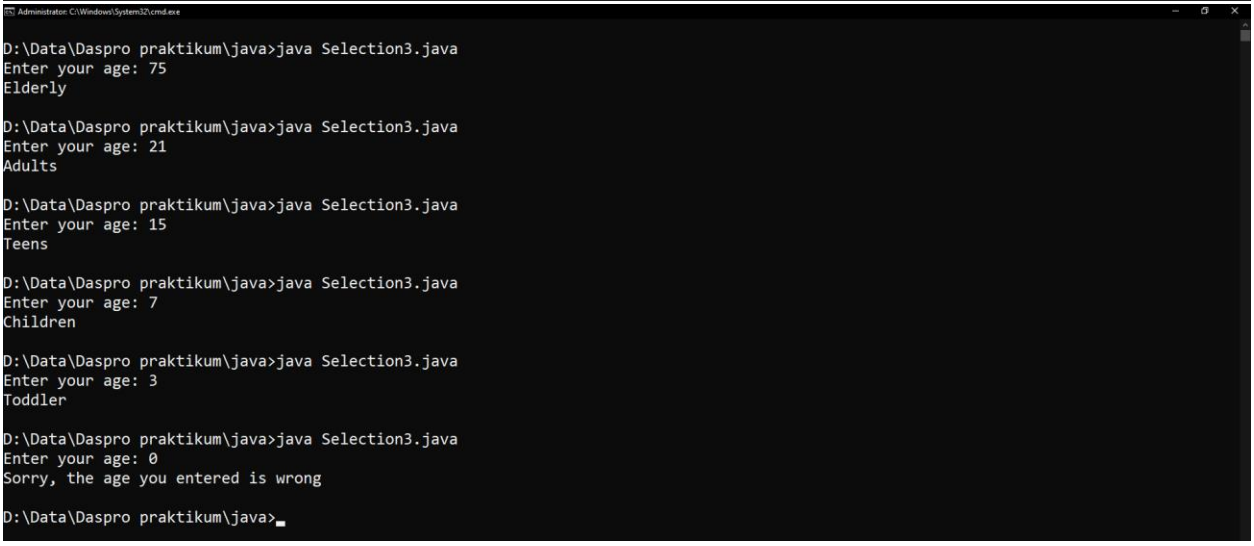
Answer!

1. There are 4 conditions, if the age is bigger than 65, 18, 12, 5 (technically its 5 if the last else condition was also counted)

2. _

```java
import java.util.Scanner;

public class Selection3 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int age;
        System.out.print(s: "Enter your age: ");
        age = input.nextInt();
        if (age > 65) {
            System.out.println(x: "Elderly");
        } else if (age > 18) {
            System.out.println(x: "Adults");
        } else if (age > 12) {
            System.out.println(x: "Teens");
        } else if (age > 5) {
            System.out.println(x: "Children");
        } else if (age > 0) {
            System.out.println(x: "Toddler");
        } else {
            System.out.println(x: "Sorry, the age you entered is wrong");
        }
    }
}
```



Experiment 4

1. Open a text editor. Create a new file, name it Selection4.java

```
public class Selection4 {
```

2. Write the basic structure of the Java programming language which containsthemain() function

```
public class Selection4 {
    Run | Debug
    public static void main(String[] args) {
```

3. Add the Scanner library. Write the following code at the top outside the class

```
import java.util.Scanner;
```

4. Make a Scanner declaration. Write the following code in the main() function

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

5. Create the following variables

```
        double number1, number2, result;
        char operator;
```

6. Write down the syntax for entering values from keyboard

```
        System.out.print(s: "Enter the first number\t\t: ");
        number1 = input.nextDouble();
        System.out.print(s: "Enter the second number\t\t: ");
        number2 = input.nextDouble();
        System.out.print(s: "Enter an operator (+ - * /)\t: ");
        operator = input.next().charAt(index: 0);
```

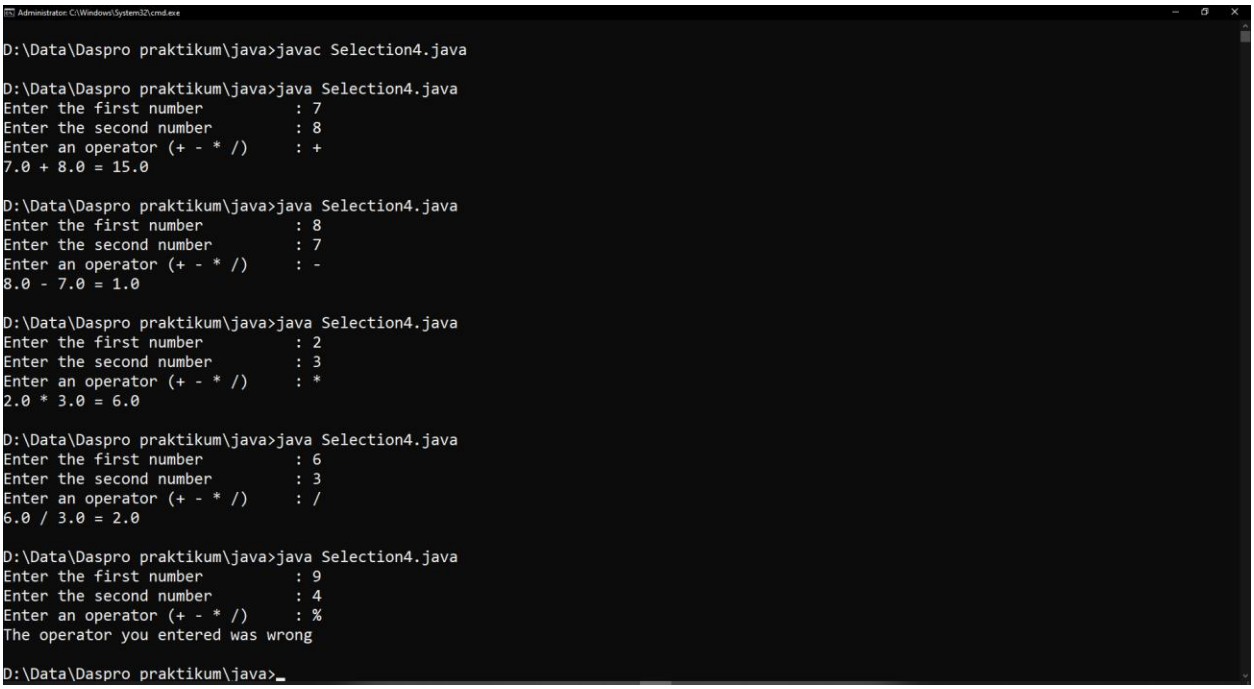
7. Add the following selection structure

```
        switch (operator) {
            case '+':
                result = number1 + number2;
                System.out.println(String.format(format: "%s + %s = %s", number1, number2, result));
                break;
            case '-':
                result = number1 - number2;
                System.out.println(String.format(format: "%s - %s = %s", number1, number2, result));
                break;
            case '*':
                result = number1 * number2;
                System.out.println(String.format(format: "%s * %s = %s", number1, number2, result));
                break;
            case '/':
                result = number1 / number2;
                System.out.println(String.format(format: "%s / %s = %s", number1, number2, result));
                break;
            default:
                System.out.println(x: "The operator you entered was wrong");
```

8. Compile and run the program. Observe the results!

```java
import java.util.Scanner;

public class Selection4 {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        double number1, number2, result;
        char operator;
        System.out.print(s: "Enter the first number\t\t: ");
        number1 = input.nextDouble();
        System.out.print(s: "Enter the second number\t\t: ");
        number2 = input.nextDouble();
        System.out.print(s: "Enter an operator (+ - * /)\t: ");
        operator = input.next().charAt(index: 0);
        switch (operator) {
            case '+':
                result = number1 + number2;
                System.out.println(String.format(format: "%s + %s = %s", number1, number2, result));
                break;
            case '-':
                result = number1 - number2;
                System.out.println(String.format(format: "%s - %s = %s", number1, number2, result));
                break;
            case '*':
                result = number1 * number2;
                System.out.println(String.format(format: "%s * %s = %s", number1, number2, result));
                break;
            case '/':
                result = number1 / number2;
                System.out.println(String.format(format: "%s / %s = %s", number1, number2, result));
                break;
            default:
                System.out.println(x: "The operator you entered was wrong");
        }
    }
}
```



Question!

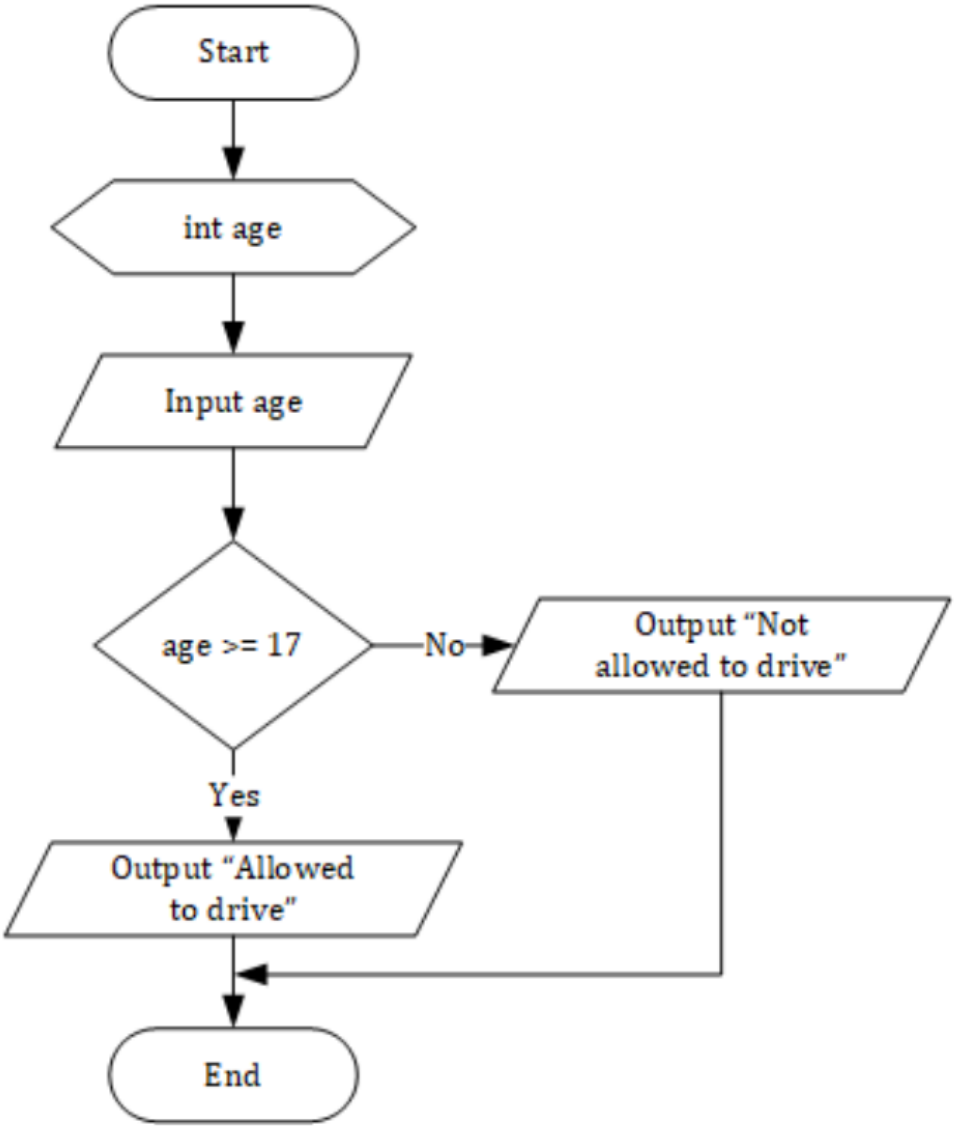
1. Explain the function of break and default in experiment 4!
2. Explain the function of the following program code commands!
   `operator = input.next().charAt(0);`

Answer!

1. The function of break is to “Jump out” of a switch statement. When entering the switch function, it tries to match the correct case based on the condition. When a match condition is found, the break statement would stop the switch test process to cut down on time. The default statement would run if the switch does not find a matching condition.
2. The input is specifying to take the first character of the input specified by putting the index 0.

Assignment

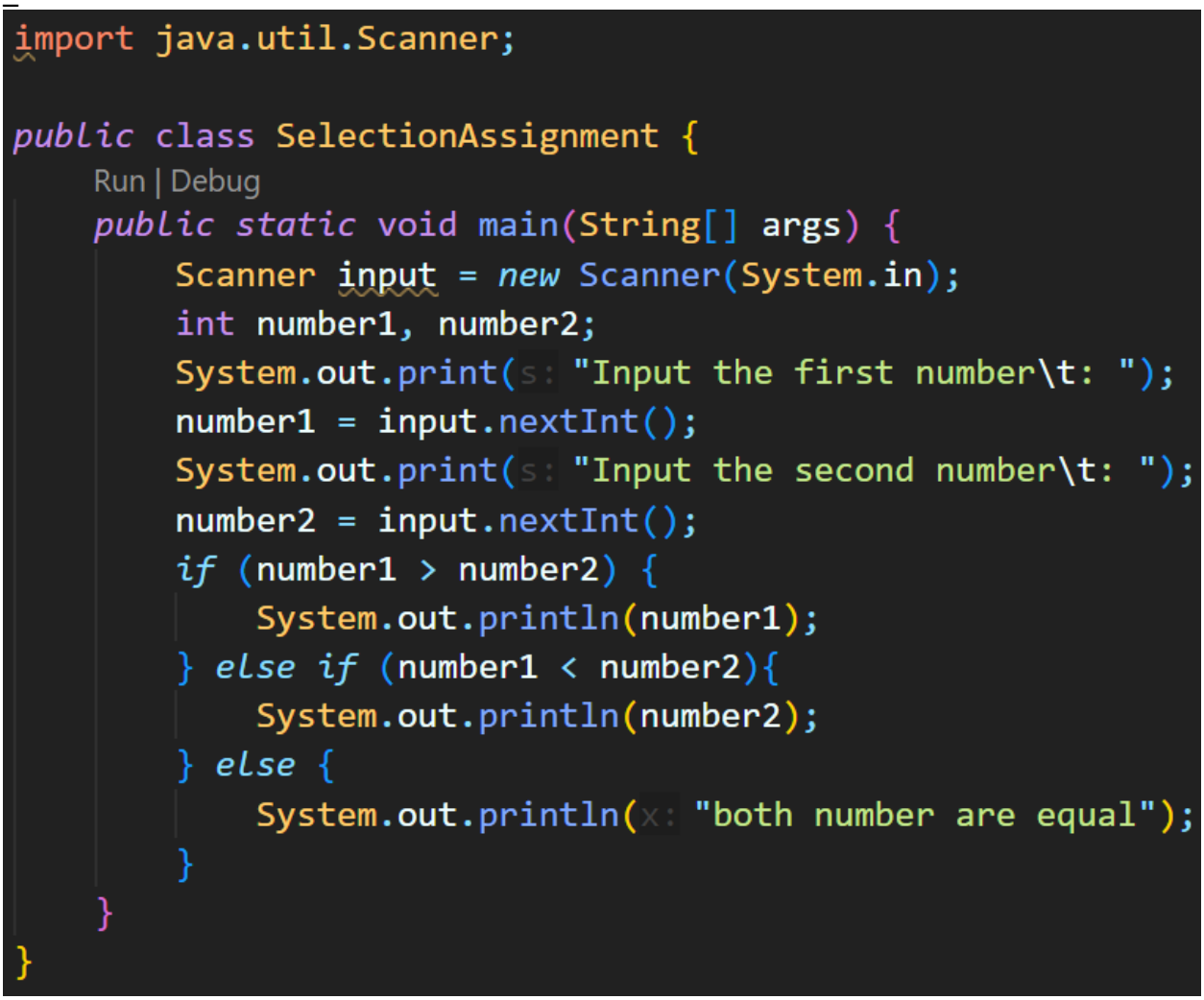
1. Create a program to input two integers, then print the one with the largest value!
2. Observe the following flowchart!



   Write program code according to the flowchart!
3. At the end of the semester a lecturer calculates the final score of students which consists of midterm exam score, final exam score, quiz scores, and assignment scores. The final score is obtained from 30% of midterm exam score, 40%offinal exam score, 10% of quiz scores, and 20% of assignment scores. If the final score of the student is less than 65, then the student will get a remedy. Create a program to help determine which students get remedies based on the final score they received!

Answer!

1. _



```java
import java.util.Scanner;

public class SelectionAssignment {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int number1, number2;
        System.out.print(s: "Input the first number\t: ");
        number1 = input.nextInt();
        System.out.print(s: "Input the second number\t: ");
        number2 = input.nextInt();
        if (number1 > number2) {
            System.out.println(number1);
        } else if (number1 < number2){
            System.out.println(number2);
        } else {
            System.out.println(x: "both number are equal");
        }
    }
}
```

2. _

```java
import java.util.Scanner;

public class AssignmentFlowchart {
    Run | Debug
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int age;
        System.out.print(s: "Enter your age: ");
        age = input.nextInt();
        if (age >= 17) {
            System.out.println(x: "Allowed to drive");
        } else {
            System.out.println(x: "Not allowed to drive");
        }
    }
}
```

3. _

```java
import java.util.Scanner;

public class FinalScore {
    Run | Debug
    public static void main(String[] args) {
        double MidtermExam, FinalExam, quiz, assignment, FinalScore;
        Scanner input = new Scanner(System.in);
        System.out.print(s: "Midterm exam score\t: ");
        MidtermExam = input.nextDouble();
        System.out.print(s: "Final exam score\t: ");
        FinalExam = input.nextDouble();
        System.out.print(s: "Quiz score\t\t: ");
        quiz = input.nextDouble();
        System.out.print(s: "Assignment score\t: ");
        assignment = input.nextDouble();
        FinalScore = (0.3 * MidtermExam) + (0.4 * FinalExam) + (0.1 * quiz) + (0.2 * assignment);
        System.out.println(String.format(format: "Final score\t\t: %s",FinalScore));
        if (FinalScore < 65) {
            System.out.println(x: "Exam remedial");
        } else {
            System.out.println(x: "Pass");
        }
    }
}
```