

## JOB SHEET 4

### SELECTION 1

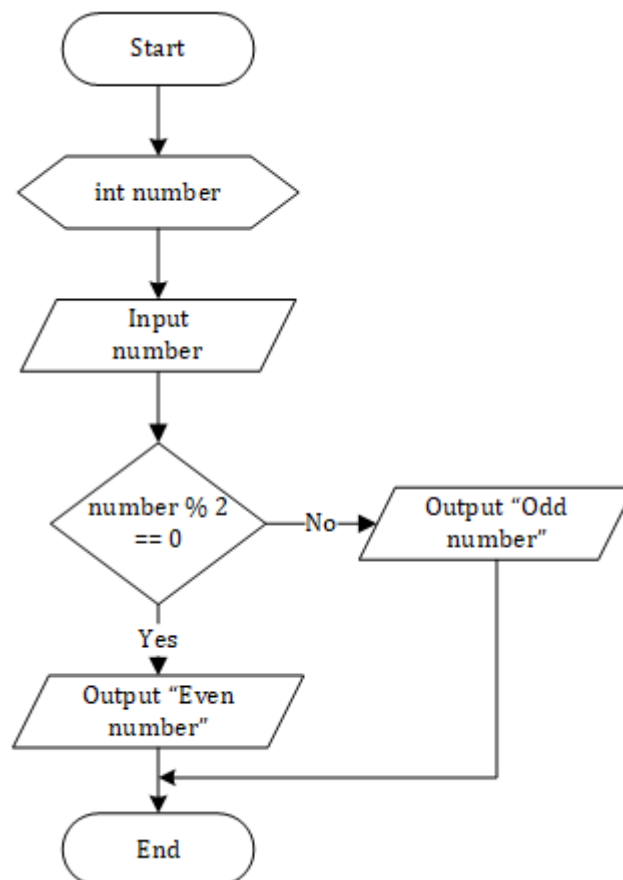
#### 1. Objective

Students are able to solve problems or case studies using selection syntax 1 and implement them in Java programming language.

#### 2. Laboratory

##### 2.1 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**
3. Write the basic structure of the Java programming language which contains the **main()** function
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  

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



6. Create an **int** variable with the name **number**

```
int number;
```

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

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

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

```
if (number % 2 == 0) {  
    System.out.println("Even number");  
} else {  
    System.out.println("Odd number");  
}
```

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

### 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!

## 2.2 Experiment 2

1. Open a text editor. Create a new file, name it **Selection2.java**
2. Write the basic structure of the Java programming language which contains the **main()** function
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("Enter a score: ");  
score = input.nextInt();
```

7. Add the following selection structure

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

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

### Questions!

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: **score1** and **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 less than 100 then it will be printed immediately!

### 2.3 Experiment 3

1. Open a text editor. Create a new file, name it **Selection3.java**
2. Write the basic structure of the Java programming language which contains the **main()** function
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("Enter your age: ");**  
**age = input.nextInt();**
7. Add the following selection structure to check the age category



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

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

### Questions!

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"!

## 2.4 Experiment 4

1. Open a text editor. Create a new file, name it **Selection4.java**
2. Write the basic structure of the Java programming language which contains the **main()** function
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("Enter the first number: ");  
number1 = input.nextDouble();  
System.out.print("Enter the second number: ");  
number2 = input.nextDouble();  
System.out.print("Enter an operator (+ - * /): ");  
operator = input.next().charAt(0);
```

## 7. Add the following selection structure

```
switch (operator) {  
    case '+':  
        result = number1 + number2;  
        System.out.println(number1 + " + " + number2 + " = " + result);  
        break;  
    case '-':  
        result = number1 - number2;  
        System.out.println(number1 + " - " + number2 + " = " + result);  
        break;  
    case '*':  
        result = number1 * number2;  
        System.out.println(number1 + " * " + number2 + " = " + result);  
        break;  
    case '/':  
        result = number1 / number2;  
        System.out.println(number1 + " / " + number2 + " = " + result);  
        break;  
    default:  
        System.out.println("The operator you entered is wrong");  
}
```

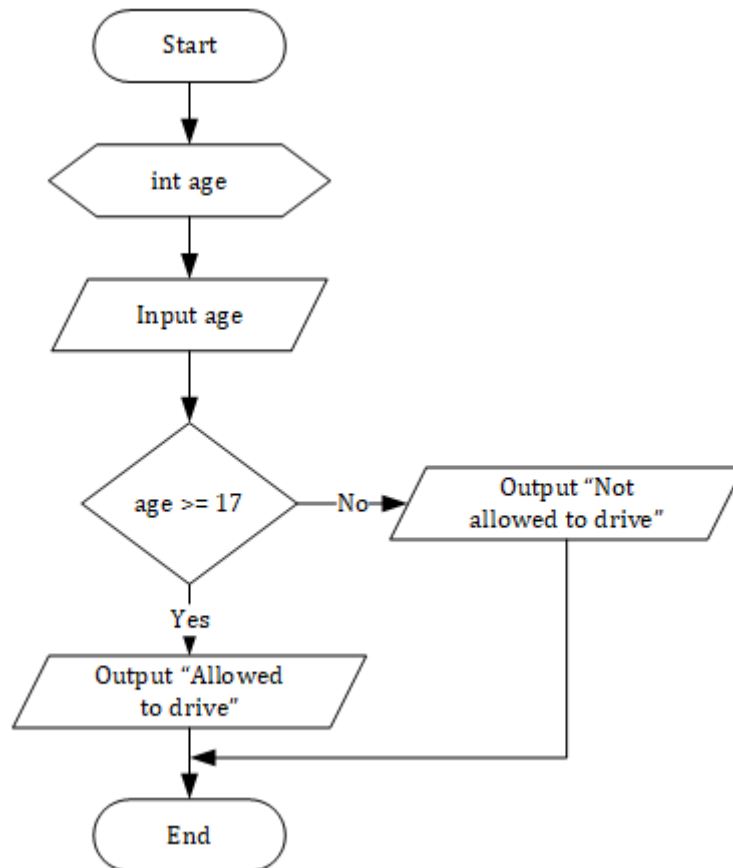
## 8. Compile and run the program. Observe the results!

**Questions!**

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);**

**3. 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% of final 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!