

## Tutorial 06

### Conditional statement: if-then, if-else, switch

#### Exercise 1:

What is the output of each of the following code fragments? (given the declaration `int a=1, b=2, c=3;`):

**A.** `if (6 < 2 * 5)  
System.out.print("Hello");  
System.out.print("There");`

**B.** `if ('a' > 'b' || 66 > (int)('A'))  
System.out.println("#*#");`

**C.** `if (a < c)  
System.out.println("*");  
else if (a == b)  
System.out.println("&");  
else  
System.out.println("$");`

**D.** `if (a<b)  
System.out.println("####");  
else  
System.out.println("&&&&");  
System.out.println("****");`

**E.** `if (a>b)  
System.out.println("####");  
else  
{System.out.println("&&&&");  
System.out.println("****");}`

**F.** `int x = 100; int y = 200;  
if (x > 100 && y <=200)  
System.out.print(x+" "+y+"  
"+(x+y));  
else  
System.out.print(x+" "+y+"  
"+(2*x-y));`

**G.** `if (a < c)  
System.out.println("*");  
else if (a == c)  
System.out.println("&");  
else  
System.out.println("$");`

**H.** `if (a<b) {  
System.out.println("####");  
System.out.println("****");  
}  
else  
System.out.println("&&&&");`

**I.** `if (a>b)  
if (a>c)  
System.out.println("1111");  
else  
System.out.println("2222");`

**J.** `if(++a > b++ || a-- > 0)  
c++;  
else  
c--;  
System.out.println(a+" "+b+" "+c);`

#### Exercise 2:

- Write the java statement that assigns 1 to x if y is greater than 0
- Suppose that score is a variable of type double. Write the java statement that increases the score by 5 marks if score is between 80 and 90
- Rewrite in Java the following statement without using the NOT (!) operator:

```
item = !( (i<10) || (v>=50) )
```

- D. Write a java statement that prints true if x is an odd number and positive
- E. Write a java statement that prints true if both x and y are positive numbers
- F. Write a java statement that prints true if x and y have the same sign (-/+)

### Exercise 3

Two programs are equivalent if given the same input they produce the same output.

Which of the following programs are equivalent? Why?

A. 

```
import java.util.Scanner;
class TestPositive {
    public static void main(String [] args) {
        Scanner S = new Scanner(System.in);
        System.out.print("Enter a value: ");
        int x = S.nextInt();
        if (x > 0) {
            System.out.println("The value is positive:");
        }
        else {
            if (x < 0) {
                System.out.println("The value is negative:");
            } else {
                System.out.println("The value is zero:");
            }
        }
        System.out.println("Good Bye!");
    }
}
```

B. 

```
import java.util.Scanner;
class TePositive {
    public static void main(String [] args) {
        Scanner S = new Scanner(System.in);
        System.out.print("Enter a value: ");
        int x = S.nextInt();
        if (x > 0) {
            System.out.println("The value is positive:");
        }
        if (x < 0) {
            System.out.println("The value is negative:");
        } else {
            System.out.println("The value is zero:");
        }
        System.out.println("Good Bye!");
    }
}
```

C. 

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

```

class TestPositive {
    public static void main(String [] args) {
        Scanner S = new Scanner(System.in);
        System.out.print("Enter a value: ");
        int x = S.nextInt();
        if (x > 0) {
            System.out.println("The value is positive:");
        }
        if (x < 0) {
            System.out.println("The value is negative:");
        }
        if (x ==0) {
            System.out.println("The value is zero:");
        }
        System.out.println("Good Bye!");
    }
}

```

## Exercise 4

Convert the following switch statement into if-else statements then into if-then statements:

```

String dayString1, dayString2, dayString3;
int day = KB.nextInt();
switch (day) {
    case 1: dayString1 = "Saturday";
    case 2: dayString2 = "Sunday";
            break;
    case 3: dayString3 = "Monday";
            break;
    case 4: dayString1 = "Tuesday";
    case 5: dayString2 = "Wednesday";
            break;
    default: dayString3 = "Invalid day";
            break;
}

```

## Tutorial 06 Solutions

### Exercise 1:

- A. Hello There
- B. `#*#`
- C. `*`
- D. `####`  
`*****`
- E. `&&&&`  
`*****`
- F. `100 200 0`
- G. `*`
- H. `####`  
`*****`
- I. No output
- J. `1 3 4`

### Exercise 2:

- A. `if (y > 0) x = 1;`
- B. `if (score >= 80 && score <=90) score += 5;`
- C. `item = i >= 10 && i < 50`
- D. `if (x % 2 != 0 && x > 0) System.out.println(true);`  
or  
`System.out.println(x%2 !=0 && x>0); // This prints false otherwise`
- E. `if (x > 0 && y > 0) System.out.println(true);`  
or  
`System.out.println(x > 0 && y > 0); // This prints false otherwise`
- F. `if (x * y > 0) System.out.println(true);`  
or  
`System.out.println(x * y > 0); // This prints false otherwise`

### Exercise 3:

Programs A and C are equivalent. Program B is different since it gives different output if input is a positive number greater than zero. For example, 3

### Exercise 4:

#### **if-else:**

```
String dayString1, dayString2, dayString3;
int day = KB.nextInt();
if (day == 1) {
    dayString1 = "Saturday";
```

```

    dayString2 = "Sunday";
}
else
    if (day == 2)
        dayString2 = "Sunday";
    else
        if (day == 3)
            dayString3 = "Monday";
        else
            if (day == 4) {
                dayString1 = "Tuesday";
                dayString2 = "Wednesday";
            }
            else
                if (day == 5)
                    dayString2 = "Wednesday";
                else
                    dayString3 = "Invalid day";

```

**if-then:**

```

String dayString1, dayString2, dayString3;
int day = KB.nextInt();
if (day == 1) {
    dayString1 = "Saturday";
    dayString2 = "Sunday";
}
if (day == 2)
    dayString2 = "Sunday";
if (day == 3)
    dayString3 = "Monday";
if (day == 4) {
    dayString1 = "Tuesday";
    dayString2 = "Wednesday";
}
if (day == 5)
    dayString2 = "Wednesday";
if (day < 1 || day > 5)
    dayString3 = "Invalid day";

```