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)`

B. `if ('a' > 'b' || 66 > (int)('A'))`

C. `if (a < c)`

D. `if(a<b)`

E. `if(a>b)`

F. `int x = 100; int y = 200;`

G. `if (a < c)`

H. `if(a<b){`

I. `if(a>b)`

J. `if(++a > b++ || a-- > 0)`

Exercise 2:

A. Write the java statement that assigns 1 to x if y is greater than 0

B. 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

C. 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.
```java
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.
```java
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:");
    } else {
      System.out.println("The value is zero:");
    }
    System.out.println("Good Bye!");
  }
}
```

C.
```java
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";
```