**King Saud University**

**College of Computer & Information Science**

**CSC111 – Tutorial 06**

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

**Objectives:**

After completing the following exercises, students will be able to:

* Trace programs that use *if-then* , *if-else* and *switch* statement
* Analyze programs with nested conditional statement
* rewrite *switch* statements as *if-else* statements or *if-then* statements

**Exercise 1:**

What is the output of each of the following code fragments?

(given the declaration int a=1, b=2, c=3;):

1. if (6 < 2 \* 5)

System.out.print("Hello");

System.out.print(" There");

2. if(a>b)

if(a>c)

System.out.println("1111");

else

System.out.println("2222");

3. if (a < c)

System.out.println("\*");

else if (a == b)

System.out.println("&");

else

System.out.println("$");

4. if(a<b)

System.out.println("####");

else

System.out.println("&&&&");

System.out.println("\*\*\*\*");

5. if(a>b)

System.out.println("####");

else

{System.out.println("&&&&");

System.out.println("\*\*\*\*");}6. 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));

7. if (a < c)

System.out.println("\*");

else if (a == c)

System.out.println("&");

else

System.out.println("$");

8. if(++a > b++ || a-- > 0)

c++;

else

c--;

System.out.println(a+" "+b+" "+c);

9. if(a<b){

System.out.println("####");

System.out.println("\*\*\*\*");

}

else

System.out.println("&&&&");

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

System.out.println("#\*#");

Answers:

**1. Hello There**

**2. No output**

**3. \***

**4. ####  
 \*\*\*\***

**5. &&&&  
 \*\*\*\***

**6. 100 200 0**

**7. \***

**8. 1 2 3**

**9. ####  
 \*\*\*\***

**10. #\*#**

**Exercise 2:**

1. Write the java statement that assigns 1 to x if y is greater than 0
2. 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
3. Rewrite in Java the following statement without using  the NOT (!) operator:   
   item = !( (i<10) | | (v>=50) )
4. Write a java statement that prints *true* if x is an odd number and positive
5. Write a java statement that prints *true* if both x and y are positive numbers
6. Write a java statement that prints *true* if x and y have the same sign (-/+)

Answer:

1. if (y > 0) x = 1;
2. if (score >= 80 && score <=90) score += 5;
3. item = i >= 10 && i < 50
4. if (x % 2 != 0 && x > 0) System.out.println(true);  
   or  
   System.out.println(x%2 !=0 && x>0); // This prints *false* otherwise
5. if (x > 0 && y > 0) System.out.println(true);  
   or  
   System.out.println(x > 0 && y > 0); // This prints *false* otherwise
6. if (x \* y > 0) System.out.println(true);  
   or  
   System.out.println(x \* y > 0); // This prints *false* otherwise

**Exercise 3:**

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

Which of the following programs are equivalent? Why?

// Program 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!”);

}

}

// Program B

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!”);

}

}

// Program 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!”);

}

}

Answer:

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:**

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;

}

Answer:

**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";