



**ASSIGNMENT (6)**

I. Show the output of each of the following programs:

<p><b>(a)</b> int x=1; while(x&lt;=20) {   if(x%5==0)     System.out.print("*");   else     System.out.print("+");   x++; }</p>	<p><b>(b)</b> int i=0; int j=7; while(i&lt;18) {   i+=(j-1);   System.out.println(i +"\t"+ j); }</p>
<p><b>(c)</b> int sum=0; int x=1; int sign=1; while (x&lt;=9) {   sum+= sign*x;   sign=-1*sign;   x+=2; } System.out.println("Sum is:" +sum);</p>	<p><b>(d)</b> int x=2; int y=11; int j; for(j=x; j&lt;=2*x*y; j+=y/x) {   System.out.println(j +"\t" +x +"\t" +y); }</p>

II. Solve each of the following programs using the three different kinds of loops: “for”, “while” and “do-while”:

- (1) Write a program that prints the even numbers from 2 to M, where M is an input entered by the user.
- (2) Write a program that calculates the sum of the integers between 1 and 100.
- (3) Write a program that calculates the sum of even numbers between M and N, where M and N are two even numbers entered by the user.
- (4) Write a program that calculates the sum of all positive integers whose sum is less than or equal to 100.



**ARAB ACADEMY FOR SCIENCE & TECHNOLOGY**  
**COURSE: INTRODUCTION TO COMPUTER PROGRAMMING**  
**LECTURER: DR. HESHAM KESHK**  
**LECTURER ASSISTANT: ENG. ALI ALLAM**

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- (5) Write a program that calculates the factorial of a number (n), using the following formula:  $[n*(n-1)*(n-2)* \dots *2*1]$ , where n is an input entered by the user. (e.g.  $5! = 5*4*3*2*1 = 120$ )
- (6) Write a program that calculates the following expression:  
 $(1 - 2 + 3 - 4 + 5 - \dots 20)$ .
- (7) Write a program that asks the user to enter ten integers, in which the program calculates the average of these numbers.
- (8) Write a program that calculates the grades average of the students. The user keeps entering the grades as long as they are valid (i.e. between 0 and 100). Once the user enters an invalid grade, the program terminates and prints the average. For example,  
Input: 67, 93, 73, 85, 75, 107  
Output: The average is 78.6
- (9) Write a program that asks the user to enter a positive number, and then displays a message to the user telling him if that number is a prime number or not. (A prime number is the one that is divisible by only two different integers, 1 and itself, e.g. 2, 3, 5, 7, 11, ...)
- (10) Write a Java program that calculates the following series until the result exceeds 1500:  
 $(16y+1)*(y+10) + (12y+3)*(2y+9) + (8y+5)*(3y+8) + \dots$   
where y is an input entered by the user.
- (11) Write a program that calculates the sum of 10 items of the shown series:  
$$\frac{2y+10}{y+1} + \frac{4y+9}{3y+3} + \frac{8y+8}{5y+9} + \frac{16y+7}{7y+27} + \dots$$
  
where y is an input entered by the user.
- (12) Write a program that calculates the sum of 10 items of the shown series:  
$$\frac{2y+1}{y+10} - \frac{6y^2+2}{2y+9} + \frac{10y^3+3}{4y+8} - \frac{14y^4+4}{8y+7} + \dots$$
  
where y is an input entered by the user.  
 $Math.pow(5,2) \equiv 5^2$