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Institute of Computer Engineering Technology

iCET Certified Master

ASSIGNMENT

Assignement	WEEK 05 - Programming Fundamentals
Name	LOOPS
Ass. Date	16th December 2023

01. Write a Java program to print "Hello World" 10 times using a for-loop.

02. Write a Java program to print integer numbers from 1 to 100 using a for-loop.

03. Write a Java program to print integer numbers from 100 to 1 using a for-loop.

04. Write a Java program to print even numbers between 1 and 100.

05. Write a Java program to print 10 random numbers between 0 to 100.

06. Write a Java program to generate 50 random numbers between 0 to 100 and print only the odd numbers.

07. Write a Java program to print all characters A to Z using a single "System.out.println()" line by line.

08. Write a Java program to find the factorial of a given integer number.

    Factorial of 4 ! =4x3x2x1

09. Write a Java program to input 50 integer numbers from the keyboard, find and print how many numbers which are greater than 100.

10. Write a Java program to input 10 marks (type int) for subjects from the keyboard, find the total and average of the marks. Your output format should be as follows:

    Total : 756
    Max : 98
    Min : 67
    Average : 75.6

11. A school is doing a check on the height and weight of all its students. The school has 100 students. Write a program which
    a. Input height and weight of all students
    b. Output the average height and weight

12. Write a Java program to print "Hello World" 10 times using for-loop and while-loop.
13. Write a java program to print integer numbers from 1 to 100 using while-loop.

14. Write a Java program to print even numbers between 1 and 100 using a while loop.

15. Write a Java program to find the sum of digits of a given number using a for loop.

16. What is the result of attempting to compile and run the following program? (Explain your answer)

```
class Example{
    public static void main(String[] args) {
        for (int i = 0; i < 10; i++){
            System.out.println(i);
        }
        for (int i = 0; i < 10; i++){
            System.out.println(i++);
        }
        for (int i = 0; i < 10; i++){
            System.out.println(++i);
        }
        int j=0;
        while(j<10){
            System.out.println(j);
            j++;
        }
        int k=0;
        while(k<10){
            System.out.println(k++);
        }
        int m=0;
        while(m<10){
            System.out.println(++m);
        }
        int n=0;
        while(n++<10){
            System.out.println(n);
        }
        int p=0;
        while(++p<10){
            System.out.println(p);
        }
```

```
            int q=0;
            do{
                System.out.println(q++);
            }while(q<10);
            int s=0;
            do{
                System.out.println(++s);
            }while(s<10);
            int t=0;
            do{
                System.out.println(t);
            }while(t++<10);
            int u=0;
            do{
                 System.out.println(u);
        }while(++u<10);
    }
}
```

17. An accountant needs to pay the salary of the working employees. Therefore he sends a receipt to the bank requesting the least amount of notes to pay **each salary**. When the salary is input, the output should be with the least number of notes and coins.

```
Input Format
============
Input number of Employees: 12
Input salary 1 : 34888
Input salary 2 : 25000
//
Input salary 12 : 56700
Output Format
============
R5000 notes     :       45
R2000 notes     :       7
R1000 notes     :       9
R500 notes      :       8
R200 notes      :       3
R100 notes      :       6
R50 notes       :       11
R20 notes       :       4
R10 coins       :       7
R5 coins        :       9
R2 coins        :       12
R1 Coins        :       8
```

18. Given code:

```
class Test{
    public static void main(String args[]){
        int x = 0;
        int y = 0;

        for(int i = 0; i<5; i++){
            if((++x > 2) || (++y > 2)){
                x++;
            }
        }
        System.out.println(x+" "+y);
    }
}
```

What is the result?

A. Prints: 5 3 B. Prints: 8 3 C. Prints: 8 2
D. Prints: 10 3 E. None of the above

19. Which of the following code fragments are legal?

A.
```
int i=0;
for(int i=0;i<10;i++){}
```

B.
```
for(int i=0;i<10;i++){}
for(int i=0;i<10;i++){}
```

C.
```
for(int i=0;i<10;i++){
    int i=3;
}
```

D.
```
{int i=0;}
for(int i=0;i<10;i++){}
```

20. Which of the following code fragment can be used to print integer numbers 100 to 109.

A.
```
for(int i=100;i<110;i++){
    System.out.println(i);
}
```

B.
```
for(int i=100;i<110;i++){
    System.out.println(i++);
}
```

C.
```
for(int i=0;i<10;i++){
    int k=100;
    System.out.println(i+k);
}
```

D.
```
for(int i=0;i<10;i++){
        int k=100;
        System.out.println(k);
        k++;
   }
```

E.
```
int k=100;
for(int i=0;i<10;i++){
        System.out.println(k);
        k++;
}
```

21. What is the output of the following code fragments?

A.
```
for(int i=0;;i++){
        System.out.println("i : "+i);
}
```

B.
```
int i=0;
for(;i<10;){
        System.out.println("i : "+i++);
}
```

C.
```
for(int i=0;i<10;i++){
        System.out.println("i : "+i++);
}
```

D.
```
for(char ch='A';ch<91;ch++){
        System.out.println("ch : "+ch);
}
```

E.
```
for(int i=0,j=10;i<=j;i++,j--){
        System.out.println(i+" "+j);
}
```

F.
```
for(int i=0;i<128;i++){
        System.out.println((char)i+" "+i);
}
```

G.
```
int x=1;
for(int i=0;i<10;i++){
        int k=100;
        System.out.println(x+k);
        k++;
}
```


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22. Which of the following loop declarations are legal?

A. for(int i=0;i<10;i++){}
B. for(i=0;i<10;i++){}
C. for(int i=0;;i++){}
D. for(int i=0;i<10;){}
E. for(double d=0;d<10;d++){}
F. for(;;){}
G. for(byte b=0;b<10;b++){}
H. for(;int i=0;){}
I. for(int i=0,j=10;i++;j++){}
J. for(int i=0;;){}
K. for(char ch='A'; ch>92;ch++){}

23. Write a Java program that

A. Input a series of positive integer numbers. (-1 is used to terminate the input)
B. Output how many numbers were less than 1000.
C. Output how many numbers were greater than 1000

24. Develop a Java program that simulates the tossing of a coin ten times. Each time the coin is tossed, the program should print HEAD or TAIL line by line. Your program should keep track of how many times each possibility is tossed and print statistics at the end.

Expected Output:

HEAD
TAIL
TAIL
HEAD
TAIL
HEAD
HEAD
TAIL
TAIL
TAIL
Statistics: 4 Heads and 6 Tails

25. Develop a Java program that simulates the rolling of a six-sided dice five times. Each time the dice is rolled, the program should print the number rolled as below.

6 3 3 2 4

26. Write a Java program that simulates the rolling of a six-sided dice. Your program should first ask the user what number they want to roll and then roll the dice until the desired number is obtained. Each time the dice is rolled, the program should print the number rolled.

27. Write a Java program to find & print out the sum of digits of a number input by the user.

28. Write a Java program to reverse any integer number input by the user.

29. Write a program in Java that prints the lyrics to the song '99 Bottles Of Beer' using a for loop. The program should ask for how many beer bottles are on the wall at the start and then proceed to output lyrics until no more beer bottles on the wall.

    Input:

    How many bottles of beer are on the wall: 5

    Output:

    5 bottles of beer on the wall, 5 bottles of beer.
    Take one down, pass it around, 4 bottles of beer on the wall.

    4 bottles of beer on the wall, 4 bottles of beer.
    Take one down, pass it around, 3 bottles of beer on the wall.

    3 bottles of beer on the wall, 3 bottles of beer.
    Take one down, pass it around, 2 bottles of beer on the wall.

    2 bottles of beer on the wall, 2 bottles of beer.
    Take one down, pass it around, 1 bottle of beer on the wall.

    1 bottle of beer on the wall, 1 bottle of beer.
    Take one down, pass it around, no more bottles of beer on the wall.

30. Write a Java program to check whether the number is palindrome or not.

31. Develop a Java program for a principal to evaluate a teacher's progress. The program should check the teacher's contribution to teaching the particular subject. In order to do that the average of the student's marks should be found out each class. The number of students in a class at the school is not the same so -1 terminates the input. The results should be calculated and shown as follows.

No of Students	:	41
Total marks	:	3107
Maximum	:	97
Minimum	:	13
Average	:	56.455

32. Write a Java program to reverse any word input by the user.

    When user input – Hello World!
    Reverse word -!dlroW olleH

33. Write a Java program to determine if a string is a palindrome? A string is Palindrome if the reverse of a string is equal to the string itself. (Example: Madam, Level, Noon)

34. Develop a Java program to find the number of occurrences of a given character in a string input by the user.

35. Write a Java program that asks the user to enter a number for the base and another number for the exponent to find the power of a number. (Do not use Java built-in method)

36. Using Java program, count and print the number of vowels and consonants in a String.

37. Write a program that prompts the user to enter two positive integers and finds their greatest common divisor.

38. Given:

```
class Example{
    public static void main (String[] args) {
        int j = 0;
        do
            System.out.print(j);
        while (j++ < 2);
    }
}
```

What is the result of attempting to compile and run the program?

A. 0001 B. 012 C. 012012
D. 012345 E. 001122 F. 1112

39. Given:

```
class Example {
    public static void main (String[] args) {
        int j = 0;
        while (j++ < 2) {
            System.out.print(j+" ");
        }
    }
}
```

What is the result of attempting to compile and run the program?

40. Given:

```
class Example {
    public static void main(String [] args) {
        int x = 0;
        // Line 4 --insert code here--
        do { } while (x++ < y);
        System.out.println(x);
    }
}
```

Which, inserted at line 4, produces the output 12?

A. int y = x;
B. int y = 11;
C. int y = 13;
D. int y = 10;
E. int y = 12;
F. None of the above

41. Write a java program to print the following outputs using two for-loops.

0 0	0 0	5 0	5 5
0 1	1 0	5 1	5 4
0 2	2 0	5 2	5 3
0 3	3 0	5 3	5 2
0 4	4 0	5 4	5 1
1 0	0 1	4 0	4 5
1 1	1 1	4 1	4 4
1 2	2 1	4 2	4 3
1 3	3 1	4 3	4 2
1 4	4 1	4 4	4 1
2 0	0 2	3 0	3 5
2 1	1 2	3 1	3 4
2 2	2 2	3 2	3 3
2 3	3 2	3 3	3 2
2 4	4 2	3 4	3 1
3 0	0 3	2 0	2 5
3 1	1 3	2 1	2 4
3 2	2 3	2 2	2 3
3 3	3 3	2 3	2 2
3 4	4 3	2 4	2 1
4 0	0 4	1 0	1 5
4 1	1 4	1 1	1 4
4 2	2 4	1 2	1 3
4 3	3 4	1 3	1 2
4 4	4 4	1 4	1 1

42. Write a java program to print the following output using single "System.out.prnit("* ")"

```
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
* * * * * * * * * * *
```

43. Write a java program to print the following output using single "System.out.prnit("* ")"

```
*
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * * * *
* * * * * * * *
* * * * * * * * *
* * * * * * * * * *
```

44. Write a java program to print the following output using single "System.out.prnitln("*")"

```
* * * * * * * * * * *
* * * * * * * * * *
* * * * * * * * *
* * * * * * * *
* * * * * * *
* * * * * *
* * * * *
* * * *
* * *
* *
*
```


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45. Write a Java program that prompts user for the size (a positive integer) and prints the multiplication table as shown:

```
Enter the size: 10
 *  |  1  2  3  4  5  6  7  8  9 10
-----------------------------------------
 1 |  1  2  3  4  5  6  7  8  9 10
 2 |  2  4  6  8 10 12 14 16 18 20
 3 |  3  6  9 12 15 18 21 24 27 30
 4 |  4  8 12 16 20 24 28 32 36 40
 5 |  5 10 15 20 25 30 35 40 45 50
 6 |  6 12 18 24 30 36 42 48 54 60
 7 |  7 14 21 28 35 42 49 56 63 70
 8 |  8 16 24 32 40 48 56 64 72 80
 9 |  9 18 27 36 45 54 63 72 81 90
10 | 10 20 30 40 50 60 70 80 90 100
```

46. Write a Java program that generates a random number and asks the user to guess what the number is. The program should display:
    - "Too high, try again.", If the user's guess is higher than the random number
    - "Too low, try again.", If the user's guess is lower than the random number

47. Write a Java program to display the pattern like right angle triangle with a number by taking the number of rows to be displayed.
    Expected output:-

    Input number of rows : 7

    1
    1 2
    1 2 3
    1 2 3 4
    1 2 3 4 5
    1 2 3 4 5 6
    1 2 3 4 5 6 7

48. Write a Java program to print prime numbers between 1 and 100 by using while-loop.

49. Write a program to check & print given number is Armstrong or not. (A number is Armstrong if the sum of cubes of individual digits of a number is equal to the number itself. For example 371 is an Armstrong number as $3^3 + 7^3 + 1^3 = 371$. Some other Armstrong numbers are: 0, 1, 153, 370, 407.)

50. If we list all the natural numbers below 10 that are multiples of 3 or 5, we get 3, 5, 6, and 9. The sum of these multiples is 23. Write a Java program to find the sum of all the multiples of 3 or 5 below 1000.

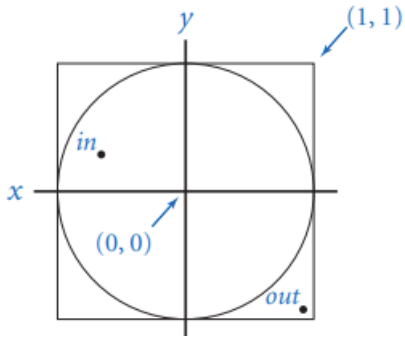
51. 2520 is the smallest number that can be divided by each of the numbers from 1 to 10 without any remainder. Write a Java program to find the smallest positive number that is evenly divisible by all of the numbers from 1 to 20.

52. Write a Java program that takes a set of words as an input and finds the number of vowels in the given set of words.

53. Write a Java program to read base and exponent values from the user and print the power of a number.

54. Write a Java program to print prime numbers between 1 and 100 by using a for-loop.

55. Develop a Java program to generate points that are randomly distributed in the unit circle. You can use Math.random() to generate x and y coordinates independently to get points that are randomly distributed in the two by two square centered on the origin. Print x and y coordinates until a point that falls outside the circle is met.



$\sqrt{x^2 + y^2} \leq 1$, *if a point falls within the unit circle*

56. What will be the output when you compile and run the following program? Explain your answer.

```
class Example{
    public static void main(String[] args) {
        int a,b,c,d,e;
        for (int i = 0; i < 10; i++){
            a=i;
        }

        int j=0;
        while(j++<10){
            b=j;
        }

        int k=0;
        do{
            c=j;
        }while(j++<10);

        int m=0;
        switch(m){
            case 0 : d=0;
        }

        int n=0;
        sw    itch(n){
            default : e=0;
        }

        System.out.println(a);     //Line 24
        System.out.println(b);     //Line 25
        System.out.println(c);     //Line 26
        System.out.println(d);     //Line 27
        System.out.println(e);     //Line 28
    }
}
```

57. Write a Java program to take an integer number and display the factors of the number.

    For example:

    When user input 24 as the number, The program should print 1, 2, 3, 4, 6, 8, 12, 24

58. What will be the result of attempting to compile and run the following code?

```
class Example {
    public static void main(String[] args) {
        boolean b = false;
        int i = 1;
        do {
            i++;
            b = ! b;
        } while (b);
        System.out.println(i);
    }
}
```

A. The code will fail to compile since b is an invalid conditional expression for the do-while statement.
B. The code will fail to compile since the assignment b = ! b is not allowed.
C. The code will compile without error and will print 1 when run.
D. The code will compile without error and will print 2 when run.
E. The code will compile without error and will print 3 when run.

59. Given:

```
class Example{
    public static void main(String[] args) {
        int k=0;
        int l=0;
        for (int i=0; i <= 3; i++) {
            k++;
            if (i == 2) break;
            l++;
        }
        System.out.println(k + ", " + l);
    }
}
```

A. The program will fail to compile.
B. The program will print 3, 3 when run.
C. The program will print 4, 3 when run if break is replaced by continue.
D. The program will fail to compile if break is replaced by return.
E. The program will fail to compile if break is simply removed

60. Which statements are true? Select the two correct answers.

A. {{}} is a valid statement block.
B. { continue; } is a valid statement block.
C. block: { break block; } is a valid statement block.
D. block: { continue block; } is a valid statement block.
E. The break statement can only be used in a loop (while, do-while or for) or a switch statement.

61. Given:

```
class Example{
    public static void main(String args[]){
        for(int i=0; i<10; i++){
            int j=i%3;
            switch(j){
                case 0: System.out.print("A ");
                    break;
                case 1: System.out.print("B ");
                    break;
                default: System.out.print(j+" ");
            }
        }
    }
}
```

What is the result of attempting to compile and run the program?

A. A B A B
B. A B 1 A B 1 A B 1 A
C. B 2 B 2
D. A B 2 A B 2 A B 2 A
E. A B A B A
F. A A 2 A B 2 A B 2 A

62. Given the following code fragment, which of the following lines will be a part of the output?

```
class Example {
    public static void main (String[] args) {
        outer:for (int i = 0; i < 3; i++) {
            for (int j = 0; j < 2; j++) {
                if (i == j) {
                    continue outer;
                }
                System.out.println("i=" + i + ", j=" + j);
            }
        }
    }
}
```

Select the two correct answers.

A. i=1, j=0
B. i=0, j=1
C. i=1, j=2
D. i=2, j=1
E. i=2, j=2
F. i=3, j=3

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63. Given:

```
class Example {
    public static void main (String args[]) {
        int x=1;
        L1:if(x>0){                    //Line 1
            System.out.print("A ");     //Line 2
            L2:if(x==1){break L1;}              //Line 3
            System.out.print("B ");     //Line 4
        }
    }
}
```

A. Error at line 1
B. Error at line 2
C. Error at line 3
D. Error at line 4
E. Prints A
F. Prints A B

64. Predict the output for the following piece of code.

```
class Example{
    public static void main(String args[]){
        for ( int i = 1 ; i <= 5 ; i++ ){
            if ( i < 5 ){
                continue;
            }else System.out.println( i );
        }
    }
}
```

A. 1 to 5 are printed on a new line each
B. 1 to 4 are printed on a new line each
C. Only 5 is printed
D. 2 to 5 are printed on a new line each
E. 2 to 4 are printed on a new line each

65. What will be the output when you compile and run the following program?

```
class Example {
    public static void main (String args[]) {
        int i = 0;
        int j = 0;
        label1: while (i++<5) {
            label2:     for (;;) {
                label3: do {
                System.out.print(i+" "+j+" ");
                switch (i+j++) {
                    case 0: continue label3;
                    case 1: continue label2;
                    case 2: continue label1;
                    case 3: break;
                    case 4: break label3;
                    case 5: break label2;
                    case 6: break label1;
                    default: break label1;
                }
                } while (++j<5);
        }
    }
}
```

A. 1 0 1 1 2 2 2 3 3 4
B. 1 2 3 4 5 2 2 3 3 4
C. 1 1 2 2 3 3 4 4 5 5
D. 0 0 1 1 2 2 2 3 3 4
E. Compile Error