



Institute of Software Engineering

Graduate Diploma in Software Engineering

ITS1010 - Programming Fundamentals – Assignment 05

Answer all the questions and submit your attempt on or before the given date.

1. Write a Java program to print "Hello World" 10 times using a for-loop.
2. Write a Java program to print integer numbers from 1 to 100 using a for-loop.
3. Write a Java program to print integer numbers from 100 to 1 using a for-loop.
4. Write a Java program to print even numbers between 1 and 100.
5. Write a Java program to print 10 random numbers between 0 to 100.
6. Write a Java program to generate random numbers between 0 to 100 and print only the odd numbers.
7. Write a Java program to print all characters A to Z using a single "System.out.println()" line by line.
8. Write a Java program to print prime numbers between 1 and 100 by using for-loop.
9. Write a Java program to find the factorial of a given integer number. (Factorial of 4 ! =4x3x2x1)
10. Enhanced the above program (Question 9) to print the factorial of numbers 0 to 10 using a for-loop.
11. Write a Java program to input 50 integer numbers from keyboard, find and print how many numbers which are greater than 100.
12. 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 should be as follows:
 Total : 756
 Max : 98
 Min : 67
 Average : 75.6
13. A school is doing a check on the height and the 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
 - c. Include any necessary error traps for the input of height and weight.
14. 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
 R1000 notes : 9
 R500 notes : 8
 R100 notes : 6
 R50 notes : 11
 R20 notes : 4
 R10 coins : 7
 R5 coins : 9
 R2 coins : 12
 R1 Coins : 8
15. 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

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

```
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. Which of the following code fragments are legal?

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

18. What will be the output when you compile and run the following code fragments?

```
import java.util.*;
class Example{
    public static void main(String args[]){
        int x=100;      //Line 1
        System.out.println(x);      //Line 2
        {
            int y=200;      //Line 3
            System.out.println(x);      //Line 4
            System.out.println(y);      //Line 5
            x++;y++;      //Line 6
        }
        int y=300;      //Line 7
        int x=40;      //Line 8
        System.out.println(x);      //Line 9
        System.out.println(y);      //Line 10
    }
}
```

- A. Error at line 5 B. Error at line 6.
- C. Error at line 7 D. Error at line 8
- E. Error at line 9 F. Error at line 10.
- G. No Errors H. None of the above

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

```
class Example{
    public static void main(String as[]){
        int x=5,y=6;
        if((x++ >= --y)&&(x-- >= ++y)){
            System.out.println(x+" "+y);
            if((x==5) || (y==6)){
                System.out.print(y+" "+x+" ");
            }
        }
        else{
            System.out.print(x+++" "+++y+" ");
        }
    }
}
```

```

    }else{
        System.out.print(x++ +" "+ ++y+" ");
    }
}
}

```

- A. Prints 5 6 6 5 B. Prints 6 5 5 6
 C. Prints 5 4 4 5 D. Prints 6 7 7 6
 E. Compile Error

20. Which of the following code fragment can be used to print integer number 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. Given:

```

class Example {
    public static void main(String[] args) {
        int a = 2;
        char b,c,d;
        b = (a < 2) ? 'f' : 'g';    // 1
        if (a < 2) c = 'h'; else c = 'i'; // 2
        if (a < 2) d = 'j';        // 3
        if (a > 2) d = 'k';        // 4
        if (a == 2) d = 'l';       // 5
        System.out.print(b + "," + c + "," + d); // 6
    }
}

```

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

- A. Prints: g, i, l
 B. Compiler Error: variable b might not have been initialized.
 C. Compiler Error: variable c might not have been initialized.

- D. Compiler Error: variable d might not have been initialized.
 E. Runtime Exception
 F. None of the above.

22. Given Code:

```

class Example{
    public static void main(String args[]){
        int a=-5;
        int b=-2;
        a%=b;
        a/=b;
        b=a>0?0:a;
        System.out.println(a+" "+b);
    }
}

```

Select one option?

- A. Prints 1 0 B. Prints -1 -1
 C. Prints -2 -2 D. Prints 0 0

23. What are the outputs 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++;
}
```

```

h. int x;
   for(int i=0;i<10;i++){
       x=100;
       System.out.println(x++);
   }
   System.out.println(x);

```

24. Given:

```

class Example{
    public static void main(String args[]){
        //line 5
        switch(x){
            default : System.out.print("4 ");
            case 1  : System.out.print("1 ");
            case 2  : System.out.print("2 ");
            case 3  : System.out.print("3 ");
        }
    }
}

```

What will be the outputs when you insert the following codes at line 5?

- A. int x=1; B. int x=2; C. int x=3;
D. int x=4; E. int x=0; F. int x=5;

25. Which of the following code fragments can be inserted at Line 10 to make Line 12 valid?

```

final int x=100;
final int y;
y=100;
int z=100;
int a;
//Insert code here                //Line 10
System.out.println(a);            //Line 12

```

- A. if(x>0){a=0;} B. a=0; C. if(y>0){a=0;}
D. if(z>0){a=0;} E. if(true){a=0;}
G. if(y>0){a=0;}else {a=-1;}
H. a=z>0?0:-1;

26. Given:

```

class Example{
    public static void main(String args[]){
        //Line 5
        switch(x){
            default : System.out.print("4 ");break;
            case 2  : System.out.print("2 ");
            case 3  : System.out.print("3 ");
            case 1  : System.out.print("1 ");break;
        }
    }
}

```

What will be the outputs when you insert the following codes at line 5?

- A. int x=1; B. int x=2; C. int x=3;
D. int x=4; E. int x=0; F. int x=5;

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

```

class Example {
    public static void main(String[] args) {
        for (int i = 0; i<10; i++) {
            switch(i) {
                case 0:
                    System.out.println(i);
            }
            if (i) {
                System.out.println(i);
            }
        }
    }
}

```

Select the one correct answer.

- A. The code will fail to compile, owing to an illegal switch expression in the switch statement.
B. The code will fail to compile, owing to an illegal conditional expression in the if statement.
C. The code will compile without error and will print the numbers 0 through 10 when run.
D. The code will compile without error and will print the number 0 when run.
E. The code will compile without error and will print the number 0 twice when run.
F. The code will compile without error and will print the numbers 1 through 10 when run.

28. Given:

```

class Example{
    public static void main(String args[]){
        int a=1;
        final int b=2;
        final int c;
        c=3;
        final char d='A';
        final char e='B';
        int x=1;
        switch(x){
            case 65: System.out.print("65");
            //Insert code//line 10
        }
    }
}

```

Which of the following codes can be inserted legally at line 10

- A. case a:// B. case b: //
 C. case c: D. case e:
 E. case f: F. case 'A':
 G. case 1.0: H. case (char)66:

29. Which of the following lines are legal?

```
import java.util.*;
class Example{
    public static void main(String args[]){
        int x=100;
        System.out.println(x);          //Line 1
        {
            int y=200;
            {
                int z=300;
                System.out.println(x);    //Line 2
                System.out.println(y);    //Line 3
                System.out.println(z);    //Line 4
            }
            System.out.println(x);        //Line 5
            System.out.println(y);        //Line 6
            System.out.println(z);        //Line 7
        }
        System.out.println(x);          //Line 8
        System.out.println(y);          //Line 9
        System.out.println(z);          //Line 10
    }
}
```

A. Line 1 B. Line 2 C. Line 3 D. Line 4
 E. Line 5 F. Line 6 G. Line 7 H. Line 8
 I. Line 9 K. Line 10

30. 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++){

31. Given:

```
//Insert code here //line 4
switch(x){
    case 'A' : System.out.println("65 ");break;
    case 'B' : System.out.println("66 ");break;
    case 'C' : System.out.println("67 ");break;
```

```
default : System.out.println("wrong ");
}
```

Which of the following codes can be inserted legally at line 4

- A. char x='A'; B. int x=65; C. int x=65536;
 D. byte x=65; E. short x=66 ;
 F. boolean x =true; G. String x="A";
 H. double x=65.0;

"using while-loop"

32. Write a Java program to print "Hello World" 10 times using for-loop and while-loop.
33. Write a Java program to print integer numbers from 1 to 100 using while-loop.
34. Write a Java program to print even numbers between 1 and 100 using while loop.
35. Write a Java program for print prime numbers between 1 and 100 by using while-loop.
36. Write a Java program to find & print out the sum of digit of a number input by a user.
37. Write a Java program to reverse an integer number input by a user.
38. Write a program to check & print whether the 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.)
39. The greatest common divisor (GCD) of two integers is the largest integer that evenly divides each of the two numbers. Write Java method GCD that returns the greatest common divisor of two integers. Use this method in a program that inputs a number and prints its results.
40. 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.
41. Write a Java method to find the no of digits of a given number.
42. Write a Java program to check whether the number is palindrome or not.
43. 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.

44. It can be seen that the number, 125874, and its double, 251748, contain the same digits, but in a different order. Write a Java program to find & print the smallest positive integer, x , such that $2x$, $3x$, $4x$, $5x$, and $6x$, contain the same digits.

45. The prime 41, can be written as the sum of six consecutive primes: $41 = 2 + 3 + 5 + 7 + 11 + 13$. This is the longest sum of consecutive primes that adds to a prime below one-hundred. Write a Java programme to find the prime number which below one-thousand that can be written as the sum of the most consecutive primes.

46. An estate agent advertises houses for sale. The Customer inquiries for 7 days working week are entered weekly into a computer. Write a Java program which

- Input the number of customer inquiries each day.
- Input the house price each customer inquiries above.
- Output how many customer inquiries each day about houses costing less than 50,000 rupees.
- Output the percentage of all enquiries made during the week about houses costing more the 5 million rupees.

47. Write a Java program that

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

48. Given:

```
class Example {  
2.  public static void main(String [] args) {  
3.      int x = 0;  
4.      // insert code here  
5.      do { } while (x++ < y);  
6.      System.out.println(x);  
7.  }  
8.}
```

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

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

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

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

50. 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;  
        switch(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  
    }  
}
```

51. 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.

52. 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?

- | | |
|----------------|----------------|
| A. 0 0 0 1 | B. 2 |
| C. 0 1 2 0 1 2 | D. 0 1 2 3 4 5 |
| E. 0 0 1 1 2 2 | F. 1 1 2 |

53. 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 |

54. 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. If the break is replaced by *continue*, the program will print 4, 3 when run.
- D. If the break is replaced by *return*, the program will fail to compile.
- E. If the break is simply removed, the program will fail to compile.

55. Which statements are true? (Select 2 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.

56. 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 |

63. 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