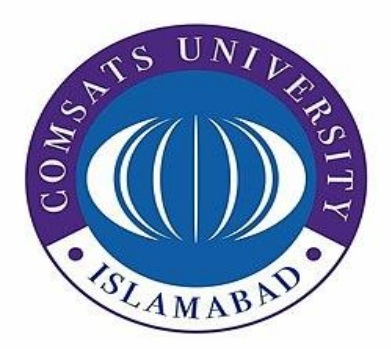

Assignment # 01

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Q1: Define and explain the programming paradigms with the help of examples.

Ans: Programming paradigms are styles of programming that shows how certain problems are solved with help of writing a code. Two major examples of paradigm are Imperative paradigm and Declarative paradigm.

Imperative Paradigm: In imperative Paradigm the user tells the machine how to change the state. For instance: Python, java.

Declarative Paradigm: In declarative Paradigm the user only tells the result which he requires. For instance: SQL.

Q2:

a)

Write JAVA statements that can produce Syntax Errors. Give three different examples and write the names of errors

Statement	Error	Reason
System.out.print("Hello World")	Missing Semicolon	; is expected
int class = 1;	Using reserved word as a variable	class is a keyword, and may not be used as an identifier
System.out.print("Java Programming);	Missing Quotation mark	" is expected

b)

Write JAVA statements that can produce Logical Errors. Give three different examples and briefly explain the reason.

Code	Error	Reason
Int avg = (1 + 2 + 3) / 2;	Wrong formula for average	Total amount should be divided by 3 instead of 2.
area = length + width;	Wrong formula for area	Length and width should be multiplied instead of addition.
If (marks > 30) { System.out.print(“grade = F”); }	Wrong logic for grading.	Symbol of less than should be used.

c)

Write JAVA statements that can produce Run Time Errors. Give three different examples and briefly explain the reason.

Code	Error	Reason
int x = 45 / 0;	Division by zero	Number cannot be divided by zero
	Input Mismatch	User enters string value instead of integer.
	File not found.	User saves file name and class name differently

d)

Code	Error	Correction
number = "ten";	String assigned to int data type variable	number = 10;

float pi = 3,1416;	Wrong use of , and wrong data type	double pi = 3.1416;
double result == 0;	Used Comparison operator instead of assignment	double result = 0;
if (number = 5)	Used assignment instead f comparison operator	If(number ==5)
System.out.println("Result is: " + result;	Missing parenthesis	System.out.println("Result is: " + result);
X = 25.67;	Didn't declared x.	double x = 25.67;

Correct Code:

```
public class d1{
public static void main(String[] args) {
int number = 10;
double  pi = 3.1416;
double result = 0;
      if (number == 5) {
         System.out.println("Number is 5");
      }
        else {
      System.out.println("Result is: " + result); }
   }
```

}

Output:

```
E:\practice>javac d1.java

E:\practice>java d1
Result is: 0.0
```

Q 3:

Elements	Example
Single Line Comment	// first number // second number // third number
Multi Line Comment	/* This program will calculate product of three numbers */
Special Symbol	[], {} and ;
Reserve Words	class, public and int
Predefined Identifiers	System, String and out
User Define Identifiers	num1, num2 and result
Standard output Stream Object	System.out

Q 4:

a)

```
String name = “Java”;
boolean isPassed = true;
int a = 5, b = 3, product = a * b;
float temperature = 36.6f;
int remainder = num1 % num2;
System.out.println(p + “ “ + q + “ “ + (p * q) / 2);
char symbol = '#';
int marks1, marks2, marks3;
double resultScore = score;
double area = 3.1416 * radius * radius;
```

b)

Statement	**a**	**b**	**c**	**d**
a = (++b) * 2 + (c- -);	21	7	6	2
c = (a++) - (- -d) + b;	22	7	27	1
b = (d- -) + (c++) * ++a;	23	622	28	0
d = (--a) + (b++) - (c--);	22	623	27	616

c)

Statement	**a**	**b**	**c**	**Sum**
sum = a + b + (int) c;	5	3	6.0	14
c /= a;	5	3	1.2	14
b += (int) c - a;	5	-1	1.2	14
a *= 2 * b + (int) c;	-5	-1	1.2	14

Q5)

Program

```
import java.util.Scanner;
        public class Q5 {
                public static void main(String[] args) {
                Scanner sc = new Scanner(System.in);

                double companyRate = 60;
                double solarRate = 7;
        System.out.print("Enter units consumed from solar system: ");
                double solarUnits = sc.nextDouble();
        System.out.print("Enter units consumed from electricity company: ");
                double companyUnits = sc.nextDouble();

                double totalUnits = solarUnits + companyUnits;
                double totalBillCompany = totalUnits * companyRate;
                double actualBill = (solarUnits * solarRate) + (companyUnits * companyRate);
                double savings = totalBillCompany - actualBill;

        System.out.printf("Total bill if all from electricity company: Rs. %.2f\n", totalBillCompany);
        System.out.printf("Actual bill: Rs. %.2f\n", actualBill);
        System.out.printf("Total savings using solar power: Rs. %.2f\n", savings);
    }
}
```

Output

```
E:\University\PF\class assignment>javac Q5.java

E:\University\PF\class assignment>java Q5
Enter units consumed from solar system: 170
Enter units consumed from electricity company: 99
Total bill if all from electricity company: Rs. 16140.00
Actual bill: Rs. 7130.00
Total savings using solar power: Rs. 9010.00
```

Q6)

Program

```
public class Q6 {
        public static void main(String[] args) {

                double weight = 62;
                double height = 1.68;
                double bmi = weight / (height * height);

        System.out.printf("Sara's BMI is: %.2f " , bmi);
    }
}
```

Output

```
E:\University\PF\class assignment>javac Q6.java

E:\University\PF\class assignment>java Q6
Sara's BMI is: 21.97
```

Q7)

Program

```
public class Q7 {
	public static void main(String[] args) {

		int monthlyIncome = 50000;
		int monthlyExpenses = 37500;
		int laptopCost = 100000;
		int monthlySavings = monthlyIncome - monthlyExpenses;
		int monthsRequired = laptopCost / monthlySavings;

	System.out.println("Ahmed's monthly savings are: Rs " + monthlySavings);
	System.out.print("Months required to buy the laptop: " + monthsRequired);
    }
}
```

Output

```
E:\University\PF\class assignment>javac Q7.java

E:\University\PF\class assignment>java Q7
Ahmed's monthly savings are: Rs 12500
Months required to buy the laptop: 8
```

Q8)

Program

```
public class Q8 {
        public static void main(String[] args) {

                double celsius = 32;
                double fahrenheit = (9.0 / 5.0 * celsius) + 32;
                double kelvin = celsius + 273.15;

        System.out.printf("Temperature in Fahrenheit: %.2f\n", fahrenheit);
        System.out.printf("Temperature in Kelvin: %.2f", kelvin);
    }
}
```

Output

```
E:\University\PF\class assignment>javac Q8.java

E:\University\PF\class assignment>java Q8
Temperature in Fahrenheit: 89.60
Temperature in Kelvin: 305.15
```

Q9)

Program

```
public class Q9 {
	public static void main(String[] args) {

		int P = 1200000;
		double annualRate = 0.12;
		double r = annualRate / 12;
		int n = 5 * 12;
		double payment = (P * r) / (1 - Math.pow(1 + r, -n));

	System.out.printf("Hassan's monthly car loan installment: Rs. %.2f", payment);
    }
}
```

Output

```
E:\University\PF\class assignment>javac Q9.java

E:\University\PF\class assignment>java Q9
Hassan's monthly car loan installment: Rs. 26693.34
```

Q10)

Program

```
import java.util.Scanner;
        public class Q10 {
                public static void main(String[] args) {
                Scanner sc = new Scanner(System.in);

        System.out.print("Total miles driven per day: ");
                double milesPerDay = sc.nextDouble();
        System.out.print("Cost per gallon of gasoline: Rs");
                double costPerGallon = sc.nextDouble();
        System.out.print("Average miles per gallon: ");
                double mpg = sc.nextDouble();
        System.out.print("Parking fees per day: Rs");
                double parking = sc.nextDouble();
        System.out.print("Tolls per day: Rs");
                double tolls = sc.nextDouble();

                double gallonsUsed = milesPerDay / mpg;
                double fuelCost = gallonsUsed * costPerGallon;
                double totalDailyCost = fuelCost + parking + tolls;

        System.out.printf("Total driving cost per day: Rs %.2f", totalDailyCost);

        sc.close();
    }
}
```

Output

```
E:\University\PF\class assignment>java Q10
Total miles driven per day: 19
Cost per gallon of gasoline: 900
Average miles per gallon: 15
Parking fees per day: 600
Tolls per day: 200
Total driving cost per day: Rs. 1940.00
```

Q11)

Program

```
import java.util.Scanner;
        public class Q11 {
                public static void main(String[] args) {
                Scanner sc = new Scanner(System.in);

        System.out.print("Enter a five-digit number: ");
        int number = sc.nextInt();

        int reverseNumber = (number % 10) * 10000 + ((number / 10) % 10) * 1000 + ((number / 100) % 10) * 100 + ((number / 1000) % 10) * 10 + (number / 10000);
        System.out.print("The reverse number: " + reverseNumber);

        sc.close();
    }
}
```

Output

```
E:\University\PF\class assignment>javac Q11.java

E:\University\PF\class assignment>java Q11
Enter a five-digit number: 45678
The reverse number: 87654
```