Assignment - 1

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Q. What do you mean by inheritance? Explain with the help of example.

The mechanism of deriving a new class from an old one such that the new class inherit all the members (variables and methods) of old class is called inheritance.

eg:

```
class Employee {  // superclass
    int salary = 40000;
}
Class Programmer extends Employee {
    // extends is used to inherit.
    int bonus = 10000;
    public static void main (String args[]) {
        Programmer p = new Programmer();
        System.out.println("Programmer salary is : " + p.salary);
        System.out.println("Bonus of Programmer is:" + p.bonus);
    }
}
```

Output:

```
Programmer salary is : 40000
Bonus of programmer is : 10000
```

Q. What is polymorphism?

Poly + morphos
↓ ↓
many forms

eg:

len() → used to find length of string
used " " no. of items in list
" " " no. of keys in dictionary.

if a variable, object or method perform different behaviour according to situation, it is called polymorphism.

Q. Write short note on.

ⓐ Class.

A class is a group of objects which have common properties.
A class is like an object constructor, or a "blueprint" for creating objects.
To create class we use the keyword class.

Syntax

```
class Main {
    int x = 5;
}
```

ⓑ Object

Object have state and behaviors. The state of an object is stored in fields (variables), while methods / functions display the object behaviour.

eg: if we consider a dog. its state and behaviour are

- state
  - name
  - breed
  - colour
- behaviour
  - barking
  - wagging tail.

ⓒ Association

Association is a relation between two separate classes which establishes through their objects. Association can be one-to-one, one-to-many, many-to-one, many-to-many.

eg: Student ⟷ Teacher (Taught by)

ⓓ Composition

When an object contains the other object and the contained object cannot exist without the other object, then it is called composition.
composition allows the reuse of code. Java doesn't support multiple inheritances but by using composition we can achieve it.

ⓔ Generalization

Generalization is the process of taking out common properties and functionalities from two or more classes and combining them together into another class which acts as the parent class of those classes or what we may say the generalized class of those specialized classes.
Generalization is termed as " is-A-relationship".

9. Define iteration statement for, for loop, while loop and do while loop with example.

Iteration statements are used to create cycle or loop in the program. Generally, it repeats a set of instructions until it satisfies the condition of termination.

For loop

```
Class ForExample {
   public static void main (string [] args) {
      for (int = 1 , i<= 5 ; i++) {
            System. out. println (i);
      }
   }
}
```

output

```
1
2
3
4
5
```

While loop

```
Class whileExample {
   public static void main ( String [] args) {
      int i = 1 ;
      while (i<=5) {
       System. out. println (i);
       i++;
   }
  }
}
```

output

```
1
2
3
4
5
```

Do-while loop

```
Class DoWhile {
   public static void main ( string[] args) {
    int i = 1 ;
    do {
        System. out. println (i);
        i++;
     }
      while (i<= 10);
   }
}
```

output

```
1
2
3
4
5
6
7
8
9
10
```

Q. Define ladder if statement with the help of program.

if-else-if ladder is used to work on multiple conditions. The if statements are executed from top to down. As soon as one of condition becomes true, the statement associated with is executed and rest of the ladder is bypassed. If none of condition is true then the final else statement gets executed.

```
Class Ladder {
    public static void main (String [] args) {
     int side = 4;
     String Shape;
    if ( side == 3 ) {
          Shape = " Triangle";
     }
    else if (side == 4) {
          Shape = " Square";
     }
    else if (side == 5) {
          Shape = " pentagon";
     }
    else {
        Shape = " Invalid Input";
     }
    System.out.println (" Shape is = " + Shape);
}
}
```

Output :

Shape is Square.