**Web Technologies (Assignment 1)**

1) Explain the four principles of object oriented programming?

There are four principles of object oriented programming. They are

1. Encapsulation

Encapsulation is the mechanism of wrapping the data (variables) and code acting on the data(methods) together as a single unit. In encapsulation the variables of a class will be hidden from other classes and can be accessed only through the methods of that class, therefore it can also called as data hiding.

example:

public class EncapTest{

private String name;

private String idNum;

private int age;

public int getName(){

return name;

}

public String getAge(){

return age;

}

public String getIdNum(){

return idNum;

}

public void setAge(int newAge){

age=newAge;

}

public void setName(String newName){

name=newName;

}

public void setIdNum(String IdNum){

idNum=newIdNum;

}

}

public class RunEncap{

public static void main(String args[]){

EncapTest encap=new EncapTest();

encap.setName("James");

encap.setAge(20);

encap.setIdNum("1234ms");

System.out.println("Name: "+encap.getName()+" " +"Age:"+encap.getAge());

}

}

1. Abstraction:

Abstraction is the process of hiding the implementation details from the user, only the functionality will be provided to the user. In other words user will have the information on what the object does instead of how it does it. The abstraction is achieved by using abstract classes and interfaces.

abstract class Bike{

abstract void run();

}

class Hoda4 extends Bik{

void run(){

System.out.println("running safely");

Public static void main(String args[]){

Bike obj=new Honda4();

obj.run();

}

}

1. Inheritance

inheritance is a mechanism in which one object acquires all the properties and behaviors of the parent object.

The idea behind inheritance is that you can create new classed that are built upon existing class, you can reuse methods and fields of the parent class, you can add new methods and fields also.

class Employee{

float salary=4000;

}

class Programmer extends Employee{

int bonus=1000;

public static void main(String args[]){

Programmer p=new Programmer();

System.out.println("Programmer salary:"+p.salary);

System.out.println("Bonus of programmer:"+p.bonus);

}

}

1. Polymorphism

Polymorphism as the name suggests one name, many forms. Polymorphism manifests itself by having multiple methods all with the same name but with slightly different functionality. There are two types of polymorphism

1. Runtime polymorphism: It is also called as overriding. It is the process in which a call to an overridden method is resolve at runtime rather than compile-time. In this process, an overridden method id called through the reference variables of a super class.

Example:

class Bike{

void run(){

System .out.println("running");

}

}

class Yamaha extends Bike{

void run(){

System.out.println("running safely with 120kms");

}

public static void main(String []args){

Bike b=new Yamaha();

b.run();

}

}

1. Compile time Polymorphism: It is also called as method overloading. If the class has different methods by same name then it is called as method overloading.

Example:

class Calculation{

void sum (int a, int b){

System.out.println(a+b);

}

Void sum(int a, int b, int c){

System.out.println(a+b+c);

}

Public static void main(String []args){

Calculation obj=new Calculation();

obj.sum(10,2);

obj.sum(1,2,3);

}

}

2)Explain the three key benefits of using object oriented Programming?

* Improved software development productivity: OOP is the modular, as it provides separation of duties in object based program development. It is also extensible, as objects can also be extended to include new attributes and behaviors. Object can also be reused within an across applications. Because of these three factors - modularity, extensibility, and reusability oop provides improved software development productivity over traditional procedure programming techniques.
* Improved software maintainability: For the reasons mentioned above, object oriented softwares is also easier to maintain. since the design is modular, part of the changes.
* Low cost of development: Reuse of software also lowers the cost of development. Typically, more effort is put into the object oriented analysis and design, which lowers the overall cost of development.
* Faster development: Reuse enables faster development. Object oriented programming languages come with rich libraries of objects, and the code developed during projects is also reusable in future projects.

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