**Assignment 3**

1. Explain polymorphism.

Polymorphism is **the ability of an object to take on many forms**.

It includes:

* Override: subclass implement the base-class methods.
* Overloading: One class has many same name methods. These methods have different parameters.

1. What is overloading?

One class has many same name methods. These methods have different parameters.

1. What is overriding?

subclass implement the base-class methods.

1. What does the final mean in this method: public void doSomething(**final** Car aCar){}

This means that inside the method the variable(aCar) cannot be reassigned.

Graphical user interface, text

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1. Suppose in question 4, the Car class has a method setColor(Color color){…}, inside doSomething method, Can we call aCar.setColor(red);?

Yes we can.

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1. Can we declare a static variable inside a method?

We can't declare a static variable inside a method, static means that it's a variable/method of a class, it belongs to the whole class but not to one of its certain objects.

1. What is the difference between interface and abstract class?

Type of methods: Interface can have only abstract methods.

Final variables: variables declared in a java interface are by default final.

Type of variables: The interface has only static and final variables. Abstract class can have final, non-final, static and non-static variables.

Implementation: Abstract class can provide the implementation of the interface. Interface can’t provide the implementation of an abstract class.

Multiple implementations: An interface can extend another Java interface only, an abstract class can extend another Java class and implement multiple Java interfaces.

Accessibility of Data Members: Members of a Java interface are public by default.

1. Can an abstract class be defined without any abstract methods?

We can’t.

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1. Since there is no way to create an object of abstract class, what’s the point of constructors of abstract class?

The main purpose of the constructor is to initialize the newly created object. In abstract class, we have an instance variable, abstract methods, and non-abstract methods. We need to initialize the non-abstract methods and instance variables, therefore abstract classes have a constructor.

1. What is a native method?

Native methods are **Java methods that start in a language other than Java**.

1. What is marker interface?

A marker interface is **an interface that has no methods or constants inside it**.

t **provides run-time type information about objects**, so the compiler and JVM have additional information about the object.

1. Why to override equals and hashCode methods?
2. What’s the difference beween int and Integer?

A int is a data type that stores **32 bit** signed two's compliment integer. On other hand Integer is a wrapper class which wraps a primitive type int into an object.

1. What is serialization?

Serialization is the **process of converting an object into a stream of bytes to store the object or transmit it to memory**, a database, or a file. I

1. Create List and Map. List A contains 1,2,3,4,10(integer) . Map B contains ("a","1") ("b","2") ("c","10") (key = string, value = string)

Graphical user interface, text

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Question: get a list which contains all the elements in list A, but not in map B.

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1. Implement a group of classes that have common behavior/state as Shape. Create Circle, Rectangle and Square for now as later on we may need more shapes. They should have the ability to calculate the area. They should be able to compare using area. Please write a program to demonstrate the classes and comparison. You can use either abstract or interface. Comparator or Comparable interface.

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