JAVA LAB

3rd chapter

School of Computer and Information Sciences
University of Hyderabad

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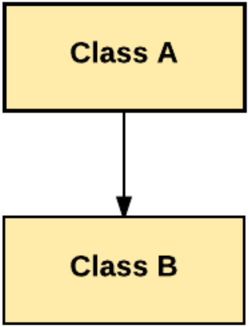
1. Inheritance
2. method Overriding
3. Overriding object class methods
4. Abstract class
5. interface
6. garbage collector

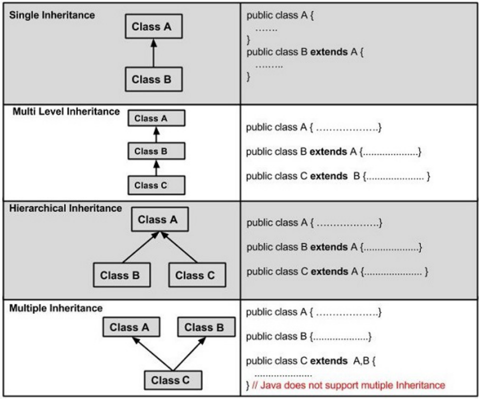
what is Inheritance?

It is mechanism in java in which one class is allow to inherit features of another class. The class which inherits features is known as subclass or child class. The other class, which is inherited is known as super class or parent class.



Types of inheritance

1. Single inheritance
2. Multilevel inheritance
3. Hierarchical inheritance
4. multiple inheritance



Single Inheritance

```
public class A {
   .......
}
public class B extends A {
   .........
}
```

Multi Level Inheritance

```
public class A { ..................}

public class B extends A {...................}

public class C extends  B {.................... }
```

Hierarchical Inheritance

```
public class A { ..................}

public class B extends A {...................}

public class C extends A {.................... }
```

Multiple Inheritance

```
public class A { ..................}

public class B {...................}

public class C extends  A,B {
   ....................
} // Java does not support mutiple Inheritance
```

method overriding

Overriding is a feature that allows a subclass or child class to provide a specific implementation of a method that is already provided by one of its super-classes or parent classes.
textbfexample:
Class1:add()
Class1 extends Class2(class2 inherits features from class1)
Class2:add()
it is possible in java
Here is example program inheritance and methodOveriding

Overriding object class methods

There is super class of all the classes we write, that is Object class. When we create a class that will be created as child class to object class. We can Override some methods in Object class.

methods in Object class:

1. protected Object clone() throws CloneNotSupportedException
2. public boolean equals(Object obj)
3. protected void finalize() throws Throwable
4. public final Class getClass() — cannot override
5. public int hashCode()
6. public String toString()
7. public final void notify()
8. public final void notifyAll()
9. public final void wait()
10. public final void wait(long timeout)
11. public final void wait(long timeout, int nanos)

Here is the example of Overriding Object class methods

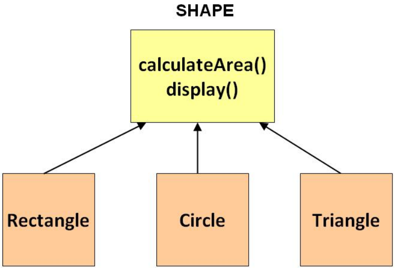
Polymorphism

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

Abstract class

Abstract class is incomplete class in which atleast one method implementation is not there, if it is there also it will treated as incomplete class as we declare it as a abstract class.
We cannot create an object to abstract class. In order to access members of abstract class, it must be inherited and abstract methods need to be implemented.
we can create object for subclass.
Syntax:
abstract class Classname

example of abstract class



Shape class is abstract class.

Here is the implementation of above example area of shape

interfaces

. The interface in Java is a mechanism to achieve abstraction.There can be only abstract methods in the Java interface, not method body. It is used to achieve abstraction. By using interfaces multiple inheritance is partially supported.

syntax:

interface Interfacename

while inherited – class Classname implements interfacename

Here is the example interface

garbage collector

In c, programmer is responsible for creating and destruction of objects. But in java the programmer need not to care for all those objects which are no longer in use. Garbage collector destroys these objects.

It is deamon thread which is running in background always.

Two ways of implementing garbage collector.

1. By using System.gc():
2. By using Runtime.getRuntime().gc();

Here is the example program of garbage collector.