Day 2

01-03-2022

Object declaration

In Java We can take the value through keyboards lot of ways

1. Scanner class.

Scanner is a pre-defined class part of util package. Package is a collection classes and interfaces.

Syntax to create the Scanner class object.

Scanner obj = new Scanner(System.in);

Day 3

02-03-2022

OOPS Concept

object : any real word entity.

Properties or state ---🡪 have

Person

Behaviour ---🡪do/does

Place

Bank

Animal

Car

Employee

Customer

class : blue print of object or template of object or user-defined data type which help describe the object.

method or function : it is use to write set of instruction to perform a specific task.

Syntax

returnType methodName(parameterList) {

}

void info() { void means to return type.

}

int getNumber() {

coding……

return 100;

}

int add(int a, int b) {

}

Syntax to create the class object.

ClassName refereceName = new ClassName();

Types of variable or fields.

1. Instance variable:
2. The variable which declared inside a class but outside a method is known as instance variable.
3. It hold default value with respective their data types : int family 🡪0, float 🡪 0.0, char 🡪 space, String null, and boolean false.
4. Instance variable we can use directly inside a all methods but method must be part of same class and it must be non static.
5. Local variable
   1. The variable which declared inside a method is known as local variable.
   2. It hold doesn’t hold default value.
   3. Scope within that method where it declared.
6. Static variable

Constructor :

Constructor is special method which help to create the object.

Points

1. Constructor have same name as class itself.
2. Constructor no return type not even void also.
3. Constructor no need to call it will call automatically when we create the object.

If we write any constructor by default empty constructor is present.

If we want we can write more than one constructor.

Encapsulation : Binding or wrapping data and code in a single unit is known as Encapsulation.

Class

**JavaBean class or POJO class(Plain Old Java Object)**

For all variable must be private and for each variable we have to provide setter and getter methods.

Setter to set the value and getter to get the value.

When we display the reference in println internally it will call toString() method of object class.

That method it return the output as [packageName.className@coede](mailto:packageName.className@coede)

So if you want meaningful output we have to override toString() method in user defined class.

Inheritance : Inheritance is use to inherits or acquire properties and behaviour of old class to new class.

class A {

}

class B extends A {

}

Types of inheritance

1. Single inheritance

Class A { }

Class B extends A{}

1. Multilevel inheritance

Class A { }

Class B extends A { }

Class C extends B{ }

Class D extends D{ }

1. Hierarchical inheritance

Class A { }

Class B extends A{ }

Class C extends A{ }

1. Multiple inheritance

Class A { }

Class B { }

Class C extends A,B{ } Wrong in Java. Java doesn’t support this type of inheritance.

It support using interface.

OOPs relationship

1. Manager/Developer Is a relationship Employee
2. Has a relationship

abstract class Employee {

id,name,salary

}

class Manager extends Employee {

numberOfEmp;

Address add = new Address();

}

class Developer extends Employee{

techName;

}

class ProjectManager extends Manager{

}

class Address {

city,state etc.

}

Has a relationship

Association

class A {

B obj = new B(); 0, 1 or many

}

class B {

A obj1 = new A(); 0, 1 or many

}

Aggregation : but is known as weak association.

class Manager {

Address ladd = new Address();

Address padd = new Address();

}

class Address {

}

Composition it is known as strong association : composition.

class Student {

StudentHistory sh = new StudentHistory();

}

class StudentHistory {

}

Polymorphism

One name many forms.

Compile time polymorphism or static binding or early binding

Method overloading

Run time polymorphism or late binding or dynamic binding

Method overriding

abstract keyword

abstract method

abstract class

Inheritance Example

**package** com;

**class** Bike {

**void** speed() {

System.***out***.println("60km/hr");

}

}

**class** Honda **extends** Bike {

**void** color() {

System.***out***.println("Gray");

}

}

**class** Pulsar **extends** Bike {

**void** color() {

System.***out***.println("Black");

}

}

**public** **class** InheritanceDemoWithAbstrat {

**public** **static** **void** main(String[] args) {

Honda hh = **new** Honda(); hh.color(); hh.speed();

Pulsar pu = **new** Pulsar(); pu.color(); pu.speed();

}

}

Method overriding

**package** com;

**class** Bike {

**void** speed() {

System.***out***.println("60km/hr");

}

}

**class** Honda **extends** Bike {

**void** color() {

System.***out***.println("Gray");

}

}

**class** Pulsar **extends** Bike {

**void** speed() {

System.***out***.println("90km/hr");

}

**void** color() {

System.***out***.println("Black");

}

}

**public** **class** InheritanceDemoWithAbstrat {

**public** **static** **void** main(String[] args) {

Honda hh = **new** Honda(); hh.color(); hh.speed();

Pulsar pu = **new** Pulsar(); pu.color(); pu.speed();

}

}

**abstract class example**

**package** com;

**abstract** **class** Bike {

**abstract** **void** speed();

**void** mailage() {

System.***out***.println("50km/lt");

}

}

**abstract** **class** Honda **extends** Bike {

**void** color() {

System.***out***.println("Gray");

}

}

**class** Pulsar **extends** Bike {

**void** speed() {

System.***out***.println("90km/hr");

}

**void** color() {

System.***out***.println("Black");

}

}

**public** **class** InheritanceDemoWithAbstrat {

**public** **static** **void** main(String[] args) {

//Honda hh = new Honda(); hh.color(); hh.speed();

Pulsar pu = **new** Pulsar(); pu.color(); pu.speed();

}

}

Final keyword

final variable : if variable is final we can’t change the value of the variable.

final int A=10;

A=20; Error

final method : if method is final we can’t override that method.

final class : if class is final we can’t extends that class.

static keyword.

interface

class extends only one class

interface extends more than one interface

class implements more than one interface

interface can’t extends or implements class

interface is known as 100% pure abstract class.

interface Abc {

fields ; public static final int A=10;

methods public abstract void dis1();

}

interface Mno {

int B=20;

void dis2();

}

interface Xyz extends Abc,Mno{

int C=30;

void dis3();

}

class Demo implements Abc,Mno {

public void dis1() { }

public void dis2() { }

}

08-03-2022

**Exception Handling**

**Java**

**Compile time error run time error**

**Syntax error**

**Run time error**

**Error Exception**

**Both are pre-defined classes part of lang package.**

**The error which generate at run time which we can’t handle it .**

**JVC crash or software or hardware issue.**

**It is a type of run time error which we can handle it.**

**Divided by zero.**

**Exception pre-defined class**

**Checked exception Unchecked exception**

**RuntimeException**

**SQLException ArithmeticException**

**IOException NumberFormatException**

**ClassNotFoundException**

5

try

catch

finally

throw

throws

Try and catch example

Custom Exception

throw vs throws

try and catch

throw keyword is use to raise or generate pre-defined or user-defined exception base upon the conditions.

Syntax

throw new Exception ()

or

throw new ExceptionSubClass();

throws keyword is use to throw the exception to caller method.

void display() throws Exception, ExceptionSubClass {

}

Collection Framework

int a=10;

int abc[];

class Employee {

id,name,salary

}

Employee emp = new Employee();

emp.id=100;

emp.name=”Ravi”;

emp.salary = 12000;

array object

Employee employees[]=new Employee[10];

Collection Framework :

Collection --🡪 interface

Set, List, Queue and Map -🡪 interfaces

Set, List, Queue internally extends Collection but Map doesn’t extends Collection.

Set : Doesn’t allow duplicate. Set classes can be order, unorder and sorted.

HashSet, LinkedHashSet, TreeSet

List : allow duplicate and it maintain the order.

Stack, ArrayList and LinkedList

Queue : First in First Out

PriortyQueue

Map : help to store information in the form of key value pairs key is unique value may be duplicate.

HashMap, LinkedHashMap, TreeMap and Hashtable

Iterator

Iterable

HashMap : it is a type of Map API. It allow to store information in key value pairs.

Key must be unique.

HashSet : it is a type of Set API. It allow to store only value. Value must unique

for(Map.Entry entry: hm.entrySet())…..is this same or different?

Generics Overview

How to access elements from nested HashMap

Heap Memory

Map

HashMap

Generic wild card

Multithreading

Program : test of instruction to perform a specific task.

Process : program in execution or time taken to execute the code.

Processor : responsible to execute the code.

Thread : small execution of a code within a process.

Multi tasking

1. Process base
2. Thread base

We can create thread using two ways

1. Extends Thread
2. Implements Runnable interface.

Concurrent API

package

git

graded project

multithreading.

Synchronization : it is a concept which help to lock or block the thread. It allow only one thread to use all resources at time. To achieve synchronization we have to use synchronized keyword with method or we can use synchronized block inside method.

wait(), notify() and notifyAll()

wait : this method is use to suspend the thread.

Notify : this method is use to resume the thread.

1. More than one thread created in same memory
2. The method must be synchronized
3. These methods are part of Objet class.

deadlock

volatile

nextLine()

week 3 contents.

Lambda Java 8 Features

IO package.

Io package (input and output operation).

Stream : flow of data or it is a abstraction between source and destination.

System.in

System.out

System.err

System.out.println(“Welcome”);

Scanner obj = new Scanner(System.in);

System is a pre-defined class part of lang package. Out is reference of PrintStream class and it is a static reference.

PrintStream ps = System.out;

ps.println(“Welcome to Java”);

System.out.println(“Welcome to Java.”);

PrintStream is a pre-defined class always refer to standard output device ie console.

System.in is consider as Standard input device reference ie keyboard.

InputStream : standard output device ie keyboard.

Scanner sc = new Scanner(System.in);

Stream

byte char

1 byte 2 byte

Input Output input Output

InputStream OutputStream Reader Writer

DataInputStream DataOutputStream InputStreamReader OutputStreamWriter

FileInputStream FileOutputStream FileReader FileWriter

BufferedInputStream BufferedOutputStream BufferedReader BufferedWriter

ObjectInputStream ObjectOutputStream PrintWriter

PrintStream

Object Serialization : storing the object into external file or converting into byte format is known as object serialization.

Object

Property : variable store only property

Behaviour : methods not store

Identity : reference name not store

Java 8 Features

From Java8 onwards interface can contains method with body. But method must be default or static.

**package** com;

**interface** Abc {

**void** dis1(); // by default public and abstract consider

**public** **default** **void** dis2() {

System.***out***.println("dis2 is a Abc interface default method");

}

**public** **default** **void** dis3() {

System.***out***.println("dis3 is a Abc interface default method");

}

**public** **static** **void** dis4() {

System.***out***.println("dis4 is a Abc interface static method");

}

}

**class** Xyz **implements** Abc {

@Override

**public** **void** dis1() {

System.***out***.println("For Abc interface dis1() method body providedd by Xyz class");

}

@Override

**public** **void** dis2() {

System.***out***.println("Xyz class overrided dis2() default method");

}

//@Override

**public** **static** **void** dis4() {

System.***out***.println("It is static Xyz own method");

}

}

**public** **class** Java8InterfaceExample {

**public** **static** **void** main(String[] args) {

// **TODO** Auto-generated method stub

Xyz obj = **new** Xyz();

obj.dis1(); // overrided method

obj.dis2(); // overrided but optional

obj.dis3(); // default method

obj.*dis4*(); // calling Xyz class methodd

Abc.*dis4*(); // calling interface method

}

}

Functional interface :the interface which contains only one abstract method is known as functional interface. It can contains more than default as well as static but only one abstract method is known as functional interface.

Marker interface : The interface contains zero method or no method is known as marker interface.

Example : Serializable.

Inner classes : class within another class is known as inner class.

1. Non static inner class
2. Static inner class
3. Anonymous inner class

**package** com;

**class** Outer {

**int** a;

**void** dis1() {

System.***out***.println("Dis1 is a outer class method");

}

**class** Inner1 {

**void** dis2() {

System.***out***.println("Dis2 is a inner non static class method");

}

}

**static** **class** Inner2 {

**void** dis3() {

System.***out***.println("Dis3 is a inner static class method");

}

}

}

**public** **class** InnerClassExample {

**public** **static** **void** main(String[] args) {

Outer out = **new** Outer();

out.dis1();

// 1st approach

//Inner1 obj = new Inner1();

Outer.Inner1 in1 = out.**new** Inner1();

in1.dis2();

//2nd approach

Outer.Inner1 in2 = **new** Outer().**new** Inner1();

in2.dis2();

Outer.Inner2 in3 = **new** Outer.Inner2();

in3.dis3();

}

}

Lambda Expression : It is as Greek word. Using Lambda expression we can do functional programming in java.

Lambda expression is known as anonymous function or methods.

Lambda expression we can use with functional interface.

**package** com;

**interface** A {

**void** dis1();

//void dis2();

}

**class** B **implements** A {

**public** **void** dis1() {

System.***out***.println("B class provided body for dis1() method");

}

}

**public** **class** AnonymousInnerClassExample {

**public** **static** **void** main(String[] args) {

//1st approach

A obj1 = **new** B();

obj1.dis1();

//2nd appoach

A obj2 = **new** A() {

**public** **void** dis1() {

System.***out***.println("A interface method override by anonymous inner class - Logic 1 ");

}

};

obj2.dis1();

A obj3 = **new** A() {

**public** **void** dis1() {

System.***out***.println("A interface method override by anonymous inner class - Logic 2");

}

};

obj3.dis1();

//3rd approach

A obj4 = ()->System.***out***.println("This is lambda expression");

obj4.dis1();

}

}

Stream API