Day 1

Agile

Git Overview

Java Basic Programming

Java OOPs Concept

Exception Handling

Packages

Lang, file handling, collection framework.

Data Structure using Java

Maven tool

Git Git is a distributed version control source code management tool.

SVN

Project : Java, .net, php, angular, react js

1%

10%

20%

A person Login module

B person Application module

C person Customer module

D person Employee module

SVN

1st Person push

Remote folder

2nd Person push

3rd Person push

Please download the git software

Install the software.

**git –version**

To make folder as a git repository we have to write the command as

**git init**

**git status :** This command is use to check the status of repository

git add filename : This command is use to send the file from file system to staging area.

git commit –m “some message”

This command use to pass the file from staging area to local repository.

**Git :** git is a open source distributed version control software tool which help to push or send the data to remote repository.

**git hub :**

AWS : code commit a to z.

Azure

Google cloud

git init

git add filename.txt

git commit –m “message”;

link local repository to remote repository

git remote add origin URL

**git push –u origin HEAD**

**Please create New folder**

**Open the git bash terminal**

**Git clone** [**https://github.com/Kaleakash/java\_oops\_phase1.git**](https://github.com/Kaleakash/java_oops_phase1.git)

**We will take the break…**

**Java : Java is a pure object oriented and platform independent programming language.**

**C : 1970**

**C with class or C++ : 1980**

**1990 :**

**Initial name of the Java is Oak :**

**Nov 1995 rename from oak to Java.**

**James gosling and Team**

**It was belong to sun micro system**

**Now it is a part of Oracle.**

**Version**

**1.0, 1.2……………..1.8,………………………………..16**

**Java 1.7**

**Java 8 Features 100%**

**Java 9**

**Java 11**

**Java 15**

**Java 8 Version**

**Simple Java program**

**Syntax of class**

**class ClassName { //**

**variables/fields;**

**methods/functions;**

**}**

**className must be follow Pascal Naming rules.**

1. **If class contains 1 world first letter upper case.**
2. **If class contains more than one world each world first letter uppers.**

**class Demo {**

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

**System.out.println("Welcome to Java...");**

**}**

**}**

**Save the program className.java**

**Demo.java**

**To compile the program open command prompt and refer to java program directory**

**javac Demo.java (javac className.java)**

**after compile successfully**

**java Demo (java classname)**

**Day 2 : 04-04-2021**

**Created 3 folder**

**Manager**

**In manager folder created Java class**

**Compiled and run the program**

**git init**

**git add .**

**git commit –m “java program created”**

git remote add origin https://github.com/Kaleakash/java\_projects.git

**HEAD last commit**

**git push –u origin master**

**git push –u origin main**

**git push –u origin HEAD (last commit in branch)**

**git push –u origin**

**origin means given the name for that URL (remote URL).**

**Ajay**

**git clone URL**

**given the instruction to Ajay write another java program with A.java**

**Vijay**

**git clone URL**

**given the instruction to Vijay write B.java program**

Branch : branch is just like a movable pointer which hold more than one commit details.

By default In git default branch created with name master/main

To check branch

git branch

Syntax to create the branch

git branch branchname

move from one branch to another branch

git checkout branchname

how to delete the branch

git branch –D branchName

1 way

Git branch branchname

Git checkout branchName

2 way

Git checkout –b branchName (created branch and switch to new branch)

Ajay Developer

Created branch using command

Git checkout –b Ajay

Created Ajay.java program

Compile and run

Git add .

Git commit –m “file created”

Git push –u origin HEAD

Then in remote branch (manager merge the Ajay from to main branch)

Then in Ajay developer come to main branch and delete ajay branch.

Pull in main/master branch from remote repository

Git pull ( from remote branch)

If you want to do any changes create the branch and push or delete if anything go wrong

Git push –u origin HEAD (From user – defined branch)

class Demo {

int a; //Ajay

int b; //Vijay

}

**Conflicts**

**Switch from one remote repository to another repository**

**Clone vs fetch command**

**Java Notes**

**class Demo {**

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

**System.out.println("Welcome to Java...");**

**}**

**}**

**Data types**

2 types

1. Primitive types : it is use to store only value

8 types

1. byte 1 byte
2. short 2
3. int 4
4. long 8 : without decimal
5. float 4
6. double 8 :with decimal
7. char 2 :single character
8. boolean 1 bit : true or false.

Data Type example

class Demo {

public static void main(String args[]) {

int a=10;

boolean b = true;

System.out.println(a);

System.out.println("The value of a "+a);

System.out.println("The value of b "+b);

}

}

Type casting

Converting from one data type to another data is known as type casting.

1. Implicit
2. Explicit

Int family

------------🡪 Implicit --------------------------🡪

byte short int long

🡨------------------Explicit ---------------------------------

class Demo {

public static void main(String args[]) {

// byte range -128 to 127

byte a=10;

short b=a; //implicit type casting

System.out.println(a);

System.out.println(b);

short c =129; //size 2

byte d = (byte)c; // (type)variableName; Explicit type casting

System.out.println(c);

System.out.println(d);

}

}

int to float family

by default every decimal number in java double consider. The memory size for double is 8 byte.

class Demo {

public static void main(String args[]) {

//implicit type casting

int a=10;

float b=a; //implicit type casting

System.out.println(a);

System.out.println(b);

//float c=10.10f;

float c = (float)10.10;

//double c = 10.10;

int d = (int)c; // explicit type casting

System.out.println(c);

System.out.println(d);

}

}

Byte casting char and int

class Demo {

public static void main(String args[]) {

int a=72;

char b=(char)a; // explicit type casting : char to int

System.out.println(a);

System.out.println(b);

char c ='A';

int d = c; //implicit type casting : int to char

System.out.println(c);

System.out.println(d);

}

}

Operator :

Arithmetic Operator : +, -, \*, /, %

Conditional Operator : >, >=,<, <=, ==, !=

Assignment operator : =

Logical operator : &&, ||, !

&& : both the condition must be true then only result true else false.

|| : if any condition true then result is true.

Increment and Decrement : ++, --

Ternary operator : condition ? true: false;

class Demo {

public static void main(String args[]) {

/\*int a=1;

int b=0;

int res = a&&b;\*/ // C/C++ but not in java

boolean a = true;

boolean b = false;

boolean res1 = a&&b;

boolean res2 = a||b;

System.out.println(res1);

System.out.println(res2);

}

}

Increment and decrement

Increment by 1

Decrement by 1

a++ : post increment

++a; : pre increment

If we are assigning the value to another variable or using inside a expression pre and post work differently.

++a: first increment and assign

a++ : first assign and increment

class Demo {

public static void main(String args[]) {

int a=10;

System.out.println(a);

a++; // increment by 1

System.out.println(a);

++a; // increment by 1

System.out.println(a);

}

}

class Demo {

public static void main(String args[]) {

/\*int a=10;

int b=a;

System.out.println(b);

b = a++; // increment by 1

System.out.println(b);

b = ++a; // increment by 1

System.out.println(b); \*/

int x = 3;

int y = ++x + x++; // 4 + 4

System.out.println(y);

System.out.println(x);

}

}

class Demo {

public static void main(String args[]) {

int a=10;

int b=50;

//int res =a>b?a:b;

String res = a>b?"a is big":"b is big";

System.out.println(res);

}

}

If statement

1. simple if
2. If else
3. Nested if
4. If else if
5. Switch statement

Looping

1. While loop
2. Do while loop
3. For loop
4. For each loop or enhanced loop

Loop is use to iterate or execute statement again and again till the condition become false.

Starting 3 types

Initialization start and end position

Condition true

Increment / decrement increment or decrement.

while loop

initialization

while(condition) {

body of the loop

increment / decrement

}

Do while loop

initialization

do{

body of the loop

increment / decrement

} while(condition)

For loop

1 2 4

for(initialization;condition;increment/decrement) {

3

}

class Demo {

public static void main(String args[]) {

/\*int i=1;

int n=10;

while(i<=n) { variableName

System.out.println(i +" , "+n);

i++; // n--;

}

System.out.println("Finish");

}\*/

/\*int i=1;

int n=10;

do {

System.out.println(i +" , "+n);

i++; // n--;

}while(i>=n);\*/

for(int i=0;i<=10;++i) {

System.out.println("i="+i);

}

}

}

While loop : we have to do the logic till the condition becomes false.

Do while : if we want to do one task without checking conditions like menu driven application

For loop : fixed iteration.

Continue and break

class Demo {

public static void main(String args[]) {

//break and condition.

for(int i=0;i<=10;i++) {

//if(i==5) break; // stop the loop

if(i==5) continue; // skip next line statement part of loop

System.out.println(i);

}

}

}

1. Non primitive types or Reference data types

It is use to store value as well as reference of another data types.

array :

class

interface

enum

array : it is user defined data types which is use to store the same type of values. It is also know as reference or non-primitive data types.

syntax

datatype arrayName[];

int abc[]; //java

int abc[10]; //C – C++ but not in java

array initialization

int abc[]={10,20,30,40,50,60};

array values store using index position start with zero.

class Demo {

public static void main(String args[]) {

int a;

int abc[];

int mno[]={};

int xyz[]={10,20,30,40,50,60};

System.out.println(xyz.length);

System.out.println(mno.length);

//System.out.println(abc.length);

System.out.println(mno);

System.out.println(xyz);

//System.out.println(mno[0]);

System.out.println(xyz[0]);

}

}

For each loop or enhanced loop

Syntax

for(datatype variableName : arrayName) {

}

Display array using for loop and enhanced loop

class Demo {

public static void main(String args[]) {

int abc[]={100,200,300,400,500,600};

System.out.println(abc[0]);

System.out.println("using for loop");

for(int i=2;i<5;i=i+1) {

System.out.println(abc[i]);

}

System.out.println("Using for each loop or enhaced loop");

for(float a : abc) { // retrieve the element begining to end one by one

System.out.println(a);

}

}

}

Creating memory size for the array

Syntax

datatype arrayName[]=new dataType[size];

int abc[]=new int[10];

In Java new is a keyword which help to create the memory at run time (dynamic(.

Default values for array created using new keyword

Int family : 0

Float family : 0.0

Char : space (white space)

Boolean : false

String : null

Day 3 : 10-04-2021

Branch creation

Git branch branchName

Git checkout branchName

Or

Git checkout –b branchName

git clone URL

first time if you want to download the project from git repository we have to use

git clone URL

git clone URL

If you want to get the new updated data from existing git repository we have use git pull

Git pull : pull all files from repository and add the local repository.

git pull

Vs

git fetch : pull all files from repository but doesn’t add the local repository.

git merge

**Java OOPs Concept**

object : object is any real world entity.

Properties or State have variables / fields

Person

Behaviour do/does functions / methods.

Place

Accno, typeOfAccount

Bank

Withdraw, deposit, transferAmount

Animal

Wheel, name, price

Car   
 start(), appliedGear(), moving, stop()

Etc

Concept.

class : blue print of object or template of object or collection of objects which have same properties and behaviour or class is user defined data types which help to create the objet.

Syntax to create the object

ClassName objectReferenceName = new ClassName();

**Simple object example**

class Car {

int wheel;

String color;

float price;

void start() {

System.out.println("Car Started...");

}

void appliedGear() {

System.out.println("Applied Gear...");

}

void moving() {

System.out.println("Car is moving...");

}

void stop() {

System.out.println("Car Stop...");

}

}

class App {

public static void main(String args[]) {

Car innova = new Car(); // memory created (heap memory)

innova.start();

innova.stop();

}

}

Type of variable or fields

In Java variable or fields are divided into 3 types

1. Instance variable
   1. The variable which declare outside method but inside a class is known as instance variable.
   2. The instance variable hold default value according to their data types

Like int family -0, float family 0.0, char –space, boolean false, string null

* 1. Instance variable we can access directly in all non-static method within a same class.

1. Local variable :
   1. The variable which declare inside a method is known as local variable.
   2. The local variable doesn’t hold default value.
   3. The scope of variable within that method where it declare.
2. Static variable

**Instance variable and local variable example**

class Car {

int wheel;

String color;

float price;

void start() {

int a=100;

System.out.println("Car Started...");

System.out.println("wheel "+wheel);

System.out.println("Price "+color);

System.out.println("Price "+price);

System.out.println("a "+a);

}

void stop() {

String msg="Welcome";

System.out.println("Car Stop...");

System.out.println("wheel "+wheel);

System.out.println("Price "+color);

System.out.println("Price "+price);

System.out.println("msg "+msg);

}

}

class App {

public static void main(String args[]) {

Car innova = new Car();

innova.start();

innova.stop();

}

}

Creating multiple objects

Example

class Abc{

int a;

void dis() {

System.out.println("a = "+a);

}

}

class App {

public static void main(String args[]) {

Abc obj1 = new Abc();

Abc obj2 = new Abc();

obj1.dis();

obj2.dis();

obj1.a=10; // assign the value for instance variable through object.

obj2.a=20;

obj1.dis();

obj2.dis();

}

}

Create Employee class with three instance variable id,name,salary

And display methods.

Create EmployeeTest class which contains main method and

Create two employee class object set the value and display the values.

Id-int

name –string

salary – float / double

**constructor :** constructor is a type of special method which help to create the object.

Pts

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

Method syntax or functions syntax

Method must be part of class

Syntax

returnType methodName(parameterList) {

method body

}

In the life of the object if we want to perform any task only one time that type of task only one time that type of task we have to write inside a constructor.

If we want to perform more than one time that type of code we have to write inside a methods.

Contructor

class Abc{

Abc() {

System.out.println("Object created....");

}

void dis() {

System.out.println("dis method");

}

}

class App {

public static void main(String args[]) {

Abc obj1=new Abc();

obj1.dis();

obj1.dis();

obj1.dis();

}

}

**Parameterized constructor.**

class Abc{

int a,b,sum;

Abc() {

a=10;

b=20;

}

Abc(int x, int y) {

a=x;

b=y;

}

void setValue(int x, int y) {

a =x;

b =y;

}

void add() {

sum = a+b;

}

void display() {

System.out.println("Sum is "+sum);

}

}

class App {

public static void main(String args[]) {

Abc obj1 = new Abc(); obj1.add(); obj1.display();

Abc obj2 = new Abc(); obj2.add(); obj2.display();

Abc obj3 = new Abc(100,200); obj3.add(); obj3.display();

Abc obj4 = new Abc(10,20); obj4.add(); obj4.display();

Abc obj5 = new Abc();

obj5.setValue(1,2);

obj5.setValue(4,5);

obj5.add();

obj5.setValue(7,8);

obj5.display();

}

}

Encapsulation :

Binding or wrapping data (variable ) and code (functions/methods) in a single

Unit is known as Encapsulation.

Example :

class Employee {

variables ;

methods ;

}

If variable is a private we can’t access those variable directly as well as through object.

Outside a class we can’t access.

this keyword

When local variable or parameter and instance variable have same name. Then local variable hide the visibility of instance variable.

If we want to access instance variable then we have to use this.varaibleName

Encapsulation Example

class Employee {

private String name;

private float salary;

//helper method

void setValue(String name, float salary) {

this.name = name;

if(salary<0) {

this.salary = 8000;

}else {

this.salary = salary;

}

}

void display() {

System.out.println("Name is "+name);

System.out.println("Salary is "+salary);

}

}

class App {

public static void main(String args[]) {

Employee emp1 = new Employee();

//emp1.name = "Ramesh";

//emp1.salary = -12000;

emp1.setValue("Ramesh",-12000);

emp1.display();

}

}

JavaBean class

Normal class Vs JavaBean class

Normal class may or may be public

Variable may be or may not be private

If variable is private we have to provide helper method to set the value and method name may be anything but meaningful name.

class Employee {

String name;

float salary;

}

JavaClass must be public

Variable must be private

For every variable we have to provide setter and getter method

Setter method to set the value and getter method is use to get the value.

public class Employee {

private String name;

private float salary;

public setName(String name) {

this.name = name;

}

public String getName() {

return this.name;

}

public setSalary(float salary) {

this.salary = salary;

}

public float getSalary() {

return this.salary;

}

}

static

static keyword we can use with variable and method but not with class.

(outer class we can’t use static keyword).

(if class inner class we can use static keyword).

Static variable and methods.

1. If variable is a static we can assign the value for that variable with help of className as well as object.
2. If method is a static we can call that method with the help of className as well objects.
3. Inside a non static method we can access static as well as non static variable directly.
4. Inside a static method we can access only static variable directly.

Static example

class Abc {

int a;

static int b;

void dis1() {

System.out.println("Non Static method");

System.out.println("a = "+this.a);

System.out.println("b = "+b);

}

static void dis2() {

System.out.println("static method");

Abc obj = new Abc();

System.out.println("a = "+obj.a);

System.out.println("b = "+b);

}

}

class App {

public static void main(String args[]) {

//a=10;

Abc obj1 = new Abc();

obj1.a=100;

Abc.b=200;

obj1.b=300;

//Abc.a=400;

obj1.dis1();

Abc.dis2();

obj1.dis2();

}

}

Difference between Heap memory and Static memory

Every class only one static memory.

Static is global to all objects.

class Abc {

int a;

static int b;

void dis1() {

System.out.println("a = "+a);

System.out.println("b = "+b);

}

}

class App {

public static void main(String args[]) {

Abc obj1 = new Abc();

Abc obj2 = new Abc();

obj1.a=10;

obj1.b=20;

Abc.b=30;

obj2.a=40;

obj2.b=50;

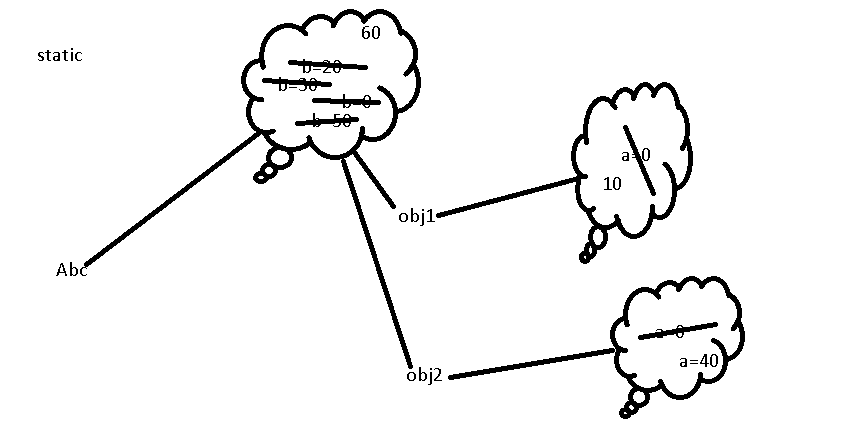
Abc.b=60;

obj1.dis1(); //a =10 , b=60

obj2.dis1(); //a=40 , b=60

}

}



**Day 4 : 11/04/2021**

Inheritance, Abstraction, Interface, final , packages, access specifiers.

super, this, this(), super()

Inheritance is use to inherit or acquire the properties and behaviour of old class to new class.

class OldClass { super class, base class, parent class,

variables;

methods;

}

class NewClass extends OldClass{ sub, derived class, child class

variables;

methods;

}

Inheritance Example

class A {

void dis1() {

System.out.println("A class method");

}

}

class B extends A{

void dis2() {

System.out.println("B class method");

}

}

class InheritanceDemo {

public static void main(String args[]) {

A obj1 = new A();

obj1.dis1();

B obj2 = new B();

obj2.dis2();

obj2.dis1();

}

}

Type of Inheritance

1. Single Inheritance : One super class and one sub class.

class A {}

class B extends A {}

1. Multilevel Inheritance : One super class and n number of sub classes connected one by one

class A {}

class B extends A {}

class C extends B{}

class D extends C{}

1. Hierarchical Inheritance : one super class and n number of sub classes connected directly to super class.

class A {}

class B extends A {}

class C extends A{}

class D extends A {}

1. Multiple Inheritance : more than one super class and one sub class.

class A {}

class B {}

class C extends A,B {} But Java doesn’t support this type of inheritance.

This type of Inheritance java support indirectly using interface.

Inheritance uni-directional not bi-directional

class A {}

class B {}

1st option

class A extends B{}

class B

2nd option

class A {}

class B extends A {}

OOPs relationship

is a

super class must be generics

class Employee{

}

class Manager extends Employee{

}

class Programmer extends Employee{

}

class SrManager extends Manager{

}

class Tester extends Employee{

}

**Inheritance Demo**

class Employee {

private int id;

private String name;

private float salary;

public void setEmployee(int id, String name, float salary) {

this.id = id;

this.name = name;

this.salary = salary;

}

public void displayEmployee() {

System.out.println("Id is "+this.id);

System.out.println("Name is "+this.name);

System.out.println("Salary is "+this.salary);

}

}

class Manager extends Employee{

private int numberOfEmp;

public void setManager(int numberOfEmp) {

this.numberOfEmp = numberOfEmp;

}

public void displayManager() {

System.out.println("Number of Employee "+numberOfEmp);

}

}

class Programmer {

}

class InheritanceDemo {

public static void main(String args[]) {

Employee emp1 = new Employee();

emp1.setEmployee(100,"Ravi",12000);

emp1.displayEmployee();

Manager mgr1 = new Manager();

mgr1.setEmployee(101,"Ajay",45000);

mgr1.setManager(12);

mgr1.displayEmployee();

mgr1.displayManager();

}

}

**Polymorphism**

One name many forms or many implementation

Compile time Run time

Static binding dynamic binding

Early binding late binding

Method Overloading Method Overriding

**Method Overloading : T**he method have same name but different parameter list (number of parameter or type of parameter must be differ)

Compile time polymorphism

class Abc {

void add(int a, int b) {

System.out.println(a+b);

}

void add(int x, int y, int z) {

System.out.println(x+y+z);

}

void add(float a, float b) {

System.out.println(a+b);

}

void add(String s1, String s2){

System.out.println(s1+s2);

}

}

class PolymorphismDemo {

public static void main(String args[]) {

Abc obj = new Abc();

obj.add(10,20); //compile time binding

obj.add(10,20,30);

obj.add(10.10f,20.20f);

obj.add("10","20");

}

}

**Method Overriding** : The method have same name and same method signature (number of parameter list type of parameter list and return type must be same).

To achieve method overriding classes must be in inheritance.

(super class and sub class).

**Annotation :** annotation is known as meta-data (data about data).

Java provided lot of pre-defined annotation.

All annotation start with @ followed by annotation names

**@Override** : This annotation we have to write in sub class method. If method overriding Then at compile time we won’t get any error. If method not overriding we will get the error.

Method Override

class Bike {

void speed() {

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

}

}

class Honda extends Bike {

void color() {

System.out.println("Black");

}

}

class Pulsar extends Bike {

@Override

void speed() { // method overriding super class method

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

}

void color() {

System.out.println("Red");

}

}

class PolymorphismDemo {

public static void main(String args[]) {

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

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

}

}

super() method invocation

class Bike {

void speed() {

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

}

}

class Honda extends Bike {

void color() {

System.out.println("Black");

}

}

class Pulsar extends Bike {

@Override

void speed() { // method overriding super class method

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

}

void color() {

System.out.println("Red");

}

}

class Tvs extends Bike {

@Override

void speed() {

super.speed(); //merge both class code 60km/hr

System.out.println("20km/hr");

}

void color() {

System.out.println("White");

}

}

class PolymorphismDemo {

public static void main(String args[]) {

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

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

Tvs t = new Tvs(); t.color(); t.speed();

}

}

Multilevel super.methodName() concept

class Bike {

void speed() {

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

}

}

class Pulsar extends Bike {

@Override

void speed() {

super.speed();

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

}

}

class SuperPulsar extends Pulsar {

@Override

void speed() {

super.speed();

System.out.println("150km/hr");

}

}

class PolymorphismDemo {

public static void main(String args[]) {

SuperPulsar sp = new SuperPulsar();

sp.speed();

}

}

**abstract :** abstract is keyword we can use with method and class but not with variable.

1. Abstract method : The method without body or without curly braces or incomplete method is known as abstract method.

abstract returnType methdoName(parameterList);

abstract void speed();

1. If class contains one or more than one abstract method then we have to declare the class as abstract class.

Syntax

abstract class className {

}

1. Whichever class extends abstract class that class must be provide the body for all abstract method belong to that class. That class can ignore if that class itself is a abstract class.
2. Abstract class we can’t create the object.
3. Abstract class can contains normal as well as abstract methods means it can contains zero, 1 or all methods.
4. Abstract class can contains constructor.

(to assign the default value for the instance variable).

Final

final is a keyword we can use with variable, method and class.

1. Final variable : to declare constant in java we use final variable

final int A=10;

So we can’t change the value.

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

final void speed() {

}

Sub class can’t override final method can use it but can’t override.

1. final class : if class is final we can’t inherit that class.

final class Demo {

}

Demo class can’t extends or inherits

Final and abstract we can’t use together.

final and abstract variable, method and class not possible.

**interface :** It is type of reference data type also known as 100% pure abstract class (till Java7).

Syntax interface.

Till Java7 version .

interface interfaceName {

fields;

methods;

}

By default all fields are public static and final

By default all method are public and abstract.

interface Abc {

public static final int A=10;

static final int B=20;

final int C=30;

int D=40;

public abstract void dis1();

abstract void dis2();

void dis3();

}

interface Abc{

int A=10;

void dis1();

}

Interface Xyz {

int B=20;

void dis1();

}

interface Mno extends Abc,Xyz{ // multiple inheritance.

int C=30;

void dis3();

}

Like a class one interface extends another interface but class can extends only one class but interface can extends more than one interface.

Class can implements one or more than one interface .

class Demo implements Abc,Xyz {

}

Whichever class implements any interface that class must be provide the body for all abstract method belong that interface.

That class can ignore only if that class itself is a abstract class.

**Access specifiers overriding rules (method)**

Super class /interface sub

public public

default (nothing) public

default

protected public

protected

default

private can’t override.

1. class extends class (only one)
2. class implements interface (many)
3. interface X class
4. interface extends interface (many)

Interface Vs Abstract class

1. variable level : abstract class can contains any type of variable (static, non static and final). But interface contains onlypublic, static and final.
2. Method level : interface contains only abstract and public methods. Abstract class can contains normal as well as abstract with public , private, protected and default methods.
3. Constructor level : interface doesn’t contains constructor but abstract class can contains default as well as we can write parameterized constructor.
4. class can (Abstract / Normal) extends only one abstract class but can implements more than one interface.

Abstraction : hiding internal implementation without knowing background details is know as abstraction.

float checkBalance(int accno) {

}

So using abstraction class we can achieve partial abstraction.

But using interface we can achieve 100% abstraction.

interface Abc {

int A=10;

void dis1();

}

interface Xyz {

int B=20;

void dis2();

}

interface Mno extends Abc,Xyz {

int C=30;

void dis3();

}

class Demo implements Mno {

public void dis1() {

System.out.println("Abc interface method");

}

public void dis2() {

System.out.println("Xyz interface method");

}

public void dis3() {

System.out.println("Mno interface method");

}

}

class PolymorphismDemo {

public static void main(String args[]) {

Demo obj = new Demo();

obj.dis1();

obj.dis2();

obj.dis3();

}

}

**Polymorphism using object creation**

class A {

void dis1() {

System.out.println("A class method");

}

}

class B extends A {

void dis1() {

System.out.println("A class overrid method");

}

void dis2() {

System.out.println("B class method");

}

}

class PolymorphismDemo {

public static void main(String args[]) {

A obj1 =new A(); obj1.dis1();

B obj2 = new B(); obj2.dis1(); obj2.dis2();

//B obj3 = new A(); //creating super class object sub class reference not possible

A obj4 = new B(); //sub class object and super class reference possible. With the help of super class reference

// we can call only those methods which belong to super class or overrided methods.

// super class may be normal class or abstract class or interface

obj4.dis1();

//obj4.dis2();

}

}

interface A {

void dis1();

}

class B implements A {

public void dis1() {

System.out.println("A class overrid method");

}

}

class PolymorphismDemo {

public static void main(String args[]) {

A obj1 = new B(); // sub class object and interface reference possible if class implementat that interface.

obj1.dis1();

}

}

Day 5 : 17-04-2021

1st

class Dog{

public static void main(String [] args) { //int size = 12; //String name = "Goofy" Dog dog = new Dog(); dog.bark(9); }

void bark(int n){ System.out.println("barking "+n+" times") }}

Multiple constructor real time example

Java 8 functions.

**Access specifiers : Access specifiers or modified help use to show the visibility .**

**public**

**protected**

**default (nothing)**

**private**

**private : we can use with instance variable, static variable, constructor, method (non static as well as static) but not with local variable and class.**

**Scope : (within a same class)**

**default : we can use with all**

**scope : (within in a same package).**

**protected : we can use with instance variable, static variable, constructor, method (non static as well as static) but not with local variable and class.**

**scope : within same package other package if it is a sub class**

**public : we can use with instance variable, static variable, constructor, method (non static as well as static), public but not for local variable.**

**scope : same package as well as other package.**

package : package is a collection of classes and interfaces.

2 types of package

1. user – defined package
2. pre-defined package or built –in package

user defined package

education

school college pg

Attendance Attendance Attendance

Package is like a directory or folder which more than one class or interface which have same name but different purpose.

Syntax to create the package

package packageName; (package name must be in lower wise)

abc

Employee

Taking the value through keywords.

In Java we can take the value through keyboard different ways

1. using Scanner

Scanner is a pre-defined class part of util(utility) package.

We have to create the Scanner class object

Syntax

import java.util.Scanner;

Scanner obj = new Scanner(System.in);

System.in: it is consider as standard input device reference : keyboard.

API : Application programming interfaces (collection of classes and interfaces) may be part of java people or user-defined or third party.

nextInt();

nextFloat();

nextDouble();

nextBoolean();

etc

to take string value we can use next() or nextLine()

next() takes only one word (if we enter the space it ignore the value)

nextLine() takes more than one word till enter the key.

The terminator for nexLine() is enter key for

Multi threading :

Program : set of instruction to perform a specific task.

Processor : processor is responsible to execute the code.

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

Thread : thread is a small execution of a code within a process. Thread also known as light weighted process. It takes less resources or memory of your machine. Thread is a part of process.

By default java is thread base programming language.

C/C++ by default process base programming language.

Inside a main method always one default thread execute.

To find the default thread details.

Thread is a pre-defined part of lang package. By default every java program import lang package.

Thread t = Thread.currentThread();

currentThread() is a static method part of Thread class. This method return type of Thread class reference or object.

System.out.println(t);

System.out.println(t);

output -🡪 main,5,main

main 🡪 name of the thread

5-🡪 priority of thread

Main 🡪 group of the thread

Min 🡪1, max 🡪 10 , norm –>5

***MAX\_PRIORITY 10***

***MIN\_PRIORITY 1***

***NORM\_PRIORITY 5***

void dis() {

}

String sayHello() {

return “welcome”

}

int add(int x, int y) {

return x+y;

}

public static Thread currentThread() {

//coding Thread t = new Thread();

return t;

}

Single tasking :

If you machine is single processor.

If we want to do multiple task. Like playing game, watching movies, typing, sending email etc.

Copy file from C -🡪 D

Copy file from E 🡪 F

Doing the task simultaneously put looks like a concurrently. The switching the task between less than micro seconds.

Printing page

1st page

2nd page

3rd page

4th page

Multi tasking :

Using process base

Using Thread base : Multi tasking using thread base is faster than process base.

Task1 task2 task3

Thread execute independently and share the same resources.

Using java how to create more than one thread to do different type of task (multi tasking).

1. Using extends Thread class
2. Using implements Runnable interface.

Using extends Thread class

1. We have to create user-defined classes and extends Thread class.
2. We have to create the Thread class reference.
3. With the help of reference we have to call start(). This method is use to ready to run the thread.
4. When we call start() method internally this method call run() method which is part of Thread class. This method is empty.
5. If we want to do custom logic we have to override that methods.

Runnable

1. We have to create user-defined class and implements Runnable interface.
2. Runnable is a interface which contains run() method and it is a type of abstract method. If class implements interface that class must be provide the body of that method.
3. Now we have to create the reference of thread class.

// We have create the object of thread class and pass the reference of that class which class implements runnable interfaces.

run() : this method is a part of Runnable interface. Thread class internally implements Runnable interface and provided empty body for run() methods.

Thread Vs Runnable

If class extends Thread class that class can’t extends any other class for different purpose.

When class extends Thread class all methods inherited in user-defined class so class become very heavy class.

..

Day 6 : 18-04-2021

Life of Thread

sleep() : this method is use to pause the thread for specific period of a time. Sleep() method is a static method we can call with the help of objects.

isAlive() : This method is use to check the status of the thread

join() : This method is use to make parent thread to wait till child thread get destroy.

wait()

notify()

notifyAll()

Create ---🡪 ready to run --🡪 running ----🡪 destroy

obj1 obj1.start() run i=10,j=10

t1 t1.start() run

Up to here to create more than one thread we created number classes and extends Thread or implements Runnable.

If I want to create 100 Thread

Booking

CheckingBalance

CreatingAccount

SendingEmail

Etc

A B

Task1 Task2

Synchronization : synchronization is a concept which help to lock the thread or block the thread or allow for only one thread to use all resource at time.

To achieve synchronization java provide synchronized keyword. This keyword we can use with method.

We can use synchronized inside a method also using block.

If method is synchronized then the code from beginning to end only one thread execute.

synchronized() {

}

100 code

1 20 multithreading

20 40 single thread

40 80 multithreading

80 100 single thread

wait(): This method is use to make the thread to wait() or suspend.

notify(): This method is use to resume or callback waited thread.

notifyAll() : This method is use to callback or resume more than one waited thread.

These method is use to do thread communication.

To work with wait() , notify() and notifyAll() method. The code must inside a synchronized method or block.

wait(), notify() and notifyAll() method are belong to Object class.

By default every java program may pre-defined or user-defined extends Object class. Object class is a part of lang package.

yield() : if two thread have same priority. If we call yield on first thread then first thread allow to execute for second thread first.

deadlock : deadlock get occurs when two method code calling each other and both are in synchronized block. So both are waiting to release each other that time deadlock occurs.

Exception Handling

Exception is a object(memory) which occurs when unexpected or abnormal conditions during the execution of programs.

Java program

Javac java

Compile run

Compile time error run time error

Syntax error

Or typing error

class Demo {

public static void main(String args[]) {

System.out.println(“Welcome”)

}

}

Run time error

Error Exception

Error and Exception both are pre-defined classes part of lang package.

Error : The error which generated at the run time which we can’t handle it is known as Error. Ex : JVM Crash, Software issue, hardware issue.

Exception : The error which generate at the run time which we can handle it is know as Exception. Ex Divided by zero.

Object

extends

Throwable

extends

Error Exception

Checked Exception Unchecked Exception

RunTimeException

IOException

InterruptedException ArrayIndexOutOfBoundsException

FileNotException ArithmeticException

SQLException NumberFomatException

Etc etc

All unchecked exception are sub class of RuntimeException

Checked exception check twice at compile time as well as run time.

To handle both the type of exception java provide 5 keywords

1. try
2. catch
3. finally
4. throw
5. throws

un checked exception

try and catch block

syntax

try {

try block

}catch(Exception e) {

catch block

}

Try block : one time or more line cod generate the exception we have to write inside a try block.

Catch block : This block will execute if any exception generate. So this block is known as exception solver block.

Try with single catch block : This type of catch block ready to handle any type of exception(generic exception handler).

Generic solution : then we have to use try with single catch block

Try with multiple catch block

But if we want to do specific task depending upon the exception then we have to use try with multiple catch block.

try {

}catch(ArithmeticException e) {

}catch(ArrayIndexOutOfBoundsException e) {

}

finally block finally block it will execute 100% sure if any exception generate or not.

try{

}catch(Exception e) {

}finally {

}

Try block : The code which generate the exception

Catch block : execute only if any exception generate

Finally it will 100% sure if any exception generate or not.

This block (finally) is use to close the resource of database or file handling

try{

open the connection db open file

store and retrieve in table read and write file

}catch(Exception e) {

}finally {

close the connection close the file

}

throw this keyword is to raise or generated pre-defined or user-defined exception depending upon the conditions.

Syntax

throw new Exception()

or

throw new ExceptionSubClass()

throws : this keyword is use to throw the exception to caller methods.

Syntax

void dis() throws Exception {

}

Throw inside a method and throws with method signature.

Day 7:

24-04-2021

File handling with Object Serialization and De-Serialization

Collection Framework with Data Structure

IO Package File Handling :

IO package

In java we do IO operation using stream.

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

Stream

byte char

1 byte 2 byte

Input Output Input Output

InputStream OutputStream Reader Writer

abstract classes

DataInputStream DataOutputStream InputStreamReader,OutputStreamWriter

FileInputStream FileOutputStream,FileReader, FileWriter

BufferedInputStream BufferedOutputStream BufferedReader,BufferdWirter

ObjectInputStream ObjectOutputStream

PrintStream PrintWriter

Byte wise / char wise

Input keyboard, File, Networking, database etc

Output monitor, Fie, networking, database etc

System is a pre-defined class and in a reference of InputStream.

System.in it is consider as standard input device reference ie keyboards.

System is a pre-define class and out is reference of PrintStream.

System.out it is consider as standard output device reference ie monitor or console

System.out.println(“Welcome”);

Demo1.java (source 🡪 keyword and destination 🡪 monitor )

Demo2.java (source 🡪 keyword and store in file)

Do {

1: Display all file present in current directory or folder in ascending order.

2:

Switch() {

switch() {

}

}

}while()

1: All file in Ascending order

2:

1: Create file

2: delete file

3: Search

4: exit from sub option

3: exit main option

Object Serialization: Storing the object itself or converting object into byte(serializable format) or storing object property into external file is known as object serialization.

Which class object we want to do serialization that class must be implements Serializable interface. Serializable interface is a type of marker interface. The interface contains zero or no method is known as maker interface.

Object Serialization

Use

1. store the object in external file that same memory we can use again and again when you do de-serialization.
2. If we want to send the object through network environment then that class must be implements serializable interface.

Object De-Serialization : converting byte format object into object format or serializable format into objet format.

Object contains 3 information

1. Property
2. Behaviour or function
3. Identity

Using object serialization we are storing only property.

Serializable this interface support to do serialization.

Collection Framework – Data Structure

Data Structure : It is a combination of two words. Data and structure. Storing the data in proper structure format using different technique.

Linear manner or format : Using array , linkedlist, vector etc.

One by one : Stack and Queue

Hierarchical format : Tree.

We will search and sort the data from data structure.

Search : binary search and linear search.

Sort : Bubble sort, selector sort, insertion sort, merge sort, quick sort etc

Time complexity and memory(size), performance.

Stack : FILO or LIFO

Stack ss = new Stack()

ss.push(100);

ss.push(200);

ss.push(300);

ss.push(400);

ss.pop() : 400

int a=10;

Collection Framework : Collection Framework provide set of collection of classes and interfaces which help to store collection of object or elements of any types like (int, float, char, string or user-defined class objects) as well as which provide set of methods which help to do operation of element or object like search, iterate, remove, add etc.

util package.

Collection -🡪 interface

All four are interfaces.

Set List Queue Map

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

Set : Set is use to store collection of elements or objects. Under set few classes maintain order, UnOrder and sorted. Set doesn’t allow duplicate.

HashSet : UnOrder

LinkedHashSet : It maintain the order.

TreeSet : TreeSet internally implements SortedSet interface and SortedSet interface internally extends Set interface.

By nature TreeSet display all element in ascending order. Because of this we have to store same type of value in TreeSet like int or float or String etc.

TreeSet provide some extra methods like headSet, tailSet, subset etc.

These classes internally (directly or in directly) implements Set interface.

List : It is use to store the collection of element or objects. List maintain the order using index position and Lis allow duplicate.

Stack : it is use to add element using FILO.

push(), pop(), peek(), search() etc.

ArrayList :

Generic array : it use to store same type of values

int abc[];

int xyz[]={10,20,30,40}

int mon[]=new int[10];

fixed memory size.

ArrayList : ArrayList is a type of collection of classes which is use to store same as well as different type of values.

ArrayList we can create dynamic memory. It is a type of collection of classes.

Arrays : It is type of static class.

If class contains all methods as static then that type of class is know as static class. But we can’t use static keyword for external class.

LinkedList : In Java LinkedList pre-defined class internally use double linked concept.

LinkedList is good option if we are doing more insertion or deletion operation.

ArrayList good option if we are retrieve the element again and again using loop or iterator.

Iterator Vs ListIterator

Iterator only forward direction

ListIterator forward as well as backward direction.

Vector : It is a legacy class(old class). By default all method in vector are synchronized. (if method are synchronized performance wise slow but output correct).

These classes internally implements List interface.

Queue : FIFO(First In First Out ) : Queue is use to achieve FIFO. Queue allow duplicate.

PriorityQueue :

FIFO base upon the priority. (lower number or ASCI code).

It is a type of Queue interface class.

Deque d = **new** ArrayDeque();

ArrayDeque is a type Queue which retrieve the elements FIFO

Map : It is use to store the value in the form of key-value pairs. Where key is unique and value may be duplicate.

Accno-name

Srno-name

HashMap doesn’t maintain the order(Un Order), HashMap can allow key as null as well as value as null.

LinkedHashMap: maintain the order (insertion or store)

TreeMap : Ascending order as key. (So key must same type of data)

Hashtable : By default all method are synchronized. And It is a legacy class. it doesn’t allow null key and value.

For each loop internal logic base upon the iterator. Iterator we can use with collection of classes. But for each loop for array as well as collection of classes.

Storing user-defined object in collection of classes.

toString() method method is use to display custom message for user-defined class objects.

com.bean

Customer Java Bean

id,name,age property

Constructor empty and parameterized

Setter and getter

toString()

com.service

List of Customer object (ArraryList, LinkedList)

addCustomer()

custId must be unique.

Age must > 21

100, Ravi,21

removeCustomer() using cusid

updateAge() : used id update the age

age must be increment not decrement.

display() age customer id,name,age using id

displayAllcustomer()

com.main

Taking the value through keyboard using Scanner class or BufferedReader in only main class.

Do {

1: Add

2 remove

3 : update age

4: display using id

5 :display all

switch() {

}

}while()

In Java Arrays and Collections are pre-defined static classes which help to do sort the data as well as searching the data.

Java Sort method are using pre-define algorithms depending upon the value stored in collection as well as arrays.

Sorting technique

Bubble Sort : The bubble sort algorithms works by repeatedly swapping adjacent elements that are not in order till the whole list of items is in sequence.

Insertion sort : The insertion sort repeatedly scans the list of items or data, each time inserting the item or data in the unordered sequence into the correct position.

Graphs and Tree

Complexity and space

Overview of Maven

Java 8 Features.

Matter and Pattern.

<https://www.surveymonkey.com/r/YKY5HMX?session_id=1765586681&type=GLVC&trainer=akash%20kale&course=&mega_category=&id=&mega_id>=