**Day 1 :**

**20-09-2020**

Programming language

Software

System software OS

Application software

C

C++

Java

Python

C#

JavaScript

Etc

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

object : object is any real world entity.

Properties or state -🡪 have 🡪name, age, height, color,

Person

Behavior -🡪do/does 🡪 teaching, sleeping, taking etc

Place

Bank

Car

Mobile

Account

Employee

Class : blue print of object or template of object.

Class syntax

class ClassName {

fields/ variables

functions / methods

}

class Demo {

public static void main(String args[]) {

System.out.println("welcome to java");

}

}

We have to same the program with ClassName.java

Java 1.0 Java 18

Java 8, 11 and 15 etc

Java

JDK : Java Development kit

JRE : Java run time environment

Variable : Variable is name which hold value and value can change during the execution of program.

a=10

a=30;

Data Types : data types is a type of data which tells what type of value it can hold.

2 types

1. Primitive data type
2. Non primitive data type or reference data type.

Primitive data type : it is use to store only value.

8 types

1. byte 1 byte
2. short 2 byte
3. int 4 byte
4. long 8 byte

without decimal (number type)

1. float 4 byte
2. double 8 byte

with decimal (number type)

1. char 2 byte : any single character
2. boolean 1 bit : true or false.

datatype variableName;

dataTyep variableName = value;

int a;

int b=100;

**Day 2:**

**22-09-2020**

Operator : Operator is use to do mathematical operation on variable.

Arithmetic Operator : +, -, \*, /, % (remainder)

Conditional operator : >, <, >=, <=, ==, !=

Logical operator : &&, ||, !

&& : both the condition must be true then result is true

|| : any condition must be true then result is true

! : negation

Assignment operator : = int a=10;

a+b=c+d; error

a+b == c+d;

increment and decrement :

variable++ n++ increment the value by one

variable-- n-- decrement the value by one

int a=10;

a=a+1;

or

a++

a=a-1;

or

a--

pre increment and post increment or pre decrement and post decrement

a=10;

a++ post increment a-- post decrement

++a pre increment --a pre decrement

If we use the variable alone then there is no difference between pre and post increment or decrement.

But if we use this variable with increment or decrement in expression or assigning to another variable then pre an post behave differently.

Pre : first increment and then we can use the value

Post : first use then increment the value.

Ternary operator : condition ? true : false;

If statement : it is use to execute set of statement base upon condition.

1. Simple if

If(condition) {

}

1. If else

If(condition) {

}else {

}

1. If else if

If(condition) {

}else if(condition) {

}else if(condition) {

}else {

}

1. Switch statement

Syntax

switch(variableName) {

case value1: block1;

break;

case value2: block2;

break;

case value3: block3;

break;

default : wrong block

break;

}

switch, case, break and default are keywords.

Variablename must be type of int, char or string.

Taking the value through keyboards in Java

1. Using Scanner class
2. DataInputStream
3. BufferedReader
4. Command Line interface

Using Scanner class

We have to create the Scanner class object.

Scanner is a pre-defined class which provided set of methods which help to take the value through keyboards.

Syntax

Scanner obj = new Scanner(System.in);

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

#include<stdio.h>

printf(“”);

Scanner obj = new Scanner(System.in);

obj.nextByte();

obj.nextShort();

obj.nextInt();

obj.nextLong();

obj.nextFloat();

obj.nextDouble();

obj.nextBoolean();

no nextChar()

String : String is pre-defined class which help to store more than one character.

**Day 3:**

**24-09-2020**

Looping : looping is use to execute set of statement again and again till condition become false.

While loop

Do while loop

For loop

For each or enhanced loop

Initialization : start and end position

Condition : must be true

Body of the loop

Increment or decrement

While loop

Initialization i=1,n=10;

while(i>=n) { entry loop

do the task

increment or decrement , i++ or n--

}

Do while loop

Initialization i=1,n=10;

do{

do the task

increment or decrement , i++ or n--

} while(i<=n); exit loop

For loop

Syntax

1 2 4

for(initialization ; condition ; increment / decrement ){

body for the for loop 3

}

1st block only once then it check the condition . It will execute 2, 3 and 4 till condition become false.

Display numbers in reverse order.

Display only even or odd number

Sum of natural numbers.

Sum of even number or odd number.

array : array is known a reference data type which is use to store more than one value of same type.

int a=10;

a=20;

a=30;

int abc[];

int []abc;

int [] abc;

int[] abc;

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

array store using index position and index position start from zero.

abc[0];

abc[1];

abc[5];

int xyz[]=new int[10]; array created with memory size 10.

xyz[0]; default vale is zero.

xyz[0]=100;

xyz[1]=200;

for each loop

for(datatype variableName: arrayname) {

}

Sum of array elements. Take the value through keyboards.

Sum of array of even or odd elements. Take the value through keyboards.

Store n number of employee details like id, name, salary.

Store n number of employee details like id, name, salary, designation

If desg is Manager 5000 bonus

If des is Develop 3000 bonus

else

1500

int num[][]={{10,20,30},{40,50,60},{70,80,90}}

**Day 4 :**

**27-09-2020**

OOPs (Object Oriented Programming System).

object : object is any real world entity or object is an instance of a class.

Properties or state🡪 have

Person

Behavior -🡪 do/does

Bank

Car

Account

Employee

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

object creation

className referenceName = new ClassName();

function or methods syntax

returnType methodName(parameterList) {

}

No passing parameter and no return type. Void is keyword we use with method for no return type.

void display() {

System.out.println(“Hello”);

}

Method with passing parameter but no return type

void add(int x, int y) {

int sum = x+y;

System.out.println(sum);

}

Method passing parameter and return value.

String sayHello(String name) {

// logic

return “Welcome user ”+name;

}

// no passing parameter but return value

int getNumber() {

// logic

return 100;

}

User defined Object Example

class Car {

int wheel;

float price;

String color;

void start() {

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

}

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[]) {

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

Car innova = new Car();

innova.start();

innova.stop();

System.out.println("Innova Santro");

Car santro = new Car();

santro.start();

santro.appliedGear();

santro.stop();

}

}

Assignment : Create any user defined object with class.

Types of variable or fields

In Java variable are divided into 3 types

1. Instance variable
   1. The variable which declare inside a class but outside a method is known as instance variable.
   2. Instance variable hold default value base upon their data type like

int family 🡪 0

float family ->0.0

boolean 🡪 false

char 🡪space

String 🡪 null

* 1. Instance variable we can use directly inside all methods but that method must be non static and part of name class.

1. Local variable
   1. The variable which declared inside a method including main method is known as local variable.
   2. Local variable doesn’t hold default value we have to initialize.
   3. The scope of the variable within that block where it declared.
2. Static variable

**Local variable and instance variable Example**

class Car {

int wheel;

float price;

String color;

void displayCarInfo() {

int temp=0;

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

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

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

System.out.println("Temp "+temp);

}

void display(){

String msg="Welcome";

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

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

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

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

System.out.println("Temp "+temp);

}

}

class App {

public static void main(String args[]) {

}

}

User defined object with instance variable and behavior

class Car {

int wheel=4;

double price=2000000;

String color="Gray";

void displayCarInfo() {

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

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

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

}

}

class App {

public static void main(String args[]) {

Car innova = new Car();

innova.displayCarInfo();

}

}

Creating more than one object of Car class and setting the value from main method and display the information

class Car {

int wheel;

double price;

String color;

void displayCarInfo(String carDetails) {

System.out.println(carDetails);

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

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

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

}

}

class App {

public static void main(String args[]) {

Car innova = new Car();

innova.wheel = 4;

innova.price = 2500000;

innova.color = "Grey";

innova.displayCarInfo("Innova Car Details");

Car ertiga = new Car();

ertiga.wheel = 4;

ertiga.color="White";

ertiga.price = 1300000;

ertiga.displayCarInfo("Ertiga Car Details");

}

}

Create Product class with instance variable as pid,pname,price and displayProductInfo method.

Inside main method create the two product class object and set the value and display the value.

User defined object with instance property, setter method, business method and display method

class Operation {

int a, b, sum;

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[]) {

Operation op1 = new Operation();

op1.display();

Operation op2 = new Operation();

op2.add();

op2.display();

Operation op3 = new Operation();

op3.a=100;

op3.b=200;

op3.display();

Operation op4 = new Operation();

op4.a=1;

op4.b=2;

op4.add();

op4.display();

Operation op5 = new Operation();

op5.setValue(10,20);

op5.add();

op5.display();

}

}

**Day 5 :**

**29-09-2022**

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

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

**// Empty constructor**

**class Employee {**

**Employee() {**

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

**}**

**void display() {**

**System.out.println("Employee class method");**

**}**

**}**

**class ConstructorDemo {**

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

**Employee emp1 = new Employee();**

**//emp1.display();**

**}**

**}**

**If local or parameter variable and instance variable have same name. local or parameter variable hide the visibility of instance variable.**

This keyword. This keyword is use to refer the current object.

If local variable and instance variable have same name if you want to refer to instance variable then we have to use this.instancevariableName;

Constructor with parameter with this keyword

class Employee {

int id;

String name;

float salary;

Employee() {

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

id =123;

name = "Unkown";

salary =8000;

}

/\*Employee(int id1, String name1, float salary1) {

System.out.println("Parameterzied constructor");

id = id1;

name = name1;

salary = salary1;

}\*/

Employee(int id, String name, float salary) {

System.out.println("Parameterzied constructor");

this.id = id;

this.name = name;

this.salary = salary;

}

void setValue(int id, String name, float salary) {

this.id = id;

this.name = name;

this.salary = salary;

}

void display() {

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

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

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

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

}

}

class ConstructorDemo {

public static void main(String args[]) {

Employee emp1 = new Employee();

Employee emp2 = new Employee();

Employee emp3 = new Employee(1,"Ravi",14000);

Employee emp4 = new Employee();

emp4.setValue(2,"Ajay",18000);

emp4.setValue(3,"Balaji",22000);

emp1.display();

emp2.display();

emp3.display();

emp4.display();

}

}

Encapsulation : binding or wrapping data (variable) and code (methods) in a single unit is known as Encapsulation.

class :

class Employee {

private int id;

private String name;

private float salary;

Employee(int id, String name, float salary) {

this.id = id;

this.name = name;

if(salary<0){

this.salary = 8000;

}else {

this.salary = salary;

}

}

void setSalary(float salary){

this.salary = salary;

}

void display() {

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

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

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

}

}

class EncapulationDemo {

public static void main(String args[]) {

//display();

//id=100;

Employee emp1 = new Employee(1,"Ravi",12000);

//emp1.id=100;

//emp1.name="Ravi";

//emp1.salary = -12000;

//emp1.setEmployeeInfo(1,"Ravi",12000);

//emp1.setSalary(14000);

emp1.display();

}

}

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

class OldClass { // super class or base class or parent class.

properties

behavior

}

class NewClass extends OldClass{ // sub class or derived class or child class.

property

behavior

}

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();

}

}

Types 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 directly connected to super class

class A { }

class B extends A{ }

class C extends A{ }

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

class A{ }

class B { }

class C extends A,B { } :Wrong in Java.

In Java we can achieve multiple inheritance using Interface.

**Day 6 :**

**06-10-2022**

OOPs relationship

is a relationship

has a relationship

is a relationship we use while using inheritance.

Has a relationship we use. Inside one class object we will create another class object.

class Employee {

id,name,salary

Address add = new Address();

}

class Manager extends Employee{

numberOfEmp

}

class Developer extends Employee{

projectName;

}

class ProjectManager extends Manager{

clientName

}

class Address {

city,state

}

Manager/Developer Is a Employee

Employee as a relationship Address

**Is a relationship and has a relationship**

import java.util.Scanner;

class Employee {

private int id;

private String name;

private float salary;

Scanner sc = new Scanner(System.in);

Address add = new Address();

void readEmp() {

System.out.println("Enter the id");

id = sc.nextInt();

System.out.println("Enter the name");

name= sc.next();

System.out.println("Enter the salary");

salary = sc.nextFloat();

}

/\*

calculateSalary hra = 10%, da = 5% and pf = 7%

grossSalary = hra, da, pf

\*/

void disEmp() {

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

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

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

}

}

class Manager extends Employee{

private int numberOfEmp;

void readMgr() {

readEmp(); // calling employee class method

System.out.println("Enter the numberOfEmployee ");

numberOfEmp = sc.nextInt();

add.readAdd(); // calling address class method

}

void disMgr() {

disEmp();

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

add.disAdd();

}

}

class Developer extends Employee {

private String projectName;

void readDev() {

readEmp();

System.out.println("Enter the projectName ");

projectName = sc.next();

add.readAdd();

}

void disDev() {

disEmp();

System.out.println("ProjectName is "+projectName);

add.disAdd();

}

}

class Address {

private String city;

private String state;

Scanner sc = new Scanner(System.in);

void readAdd() {

System.out.println("Enter the city");

city = sc.next();

System.out.println("Enter the state");

state = sc.next();

}

void disAdd() {

System.out.println("city is "+city);

System.out.println("state is "+state);

}

}

class EmployeeTest {

public static void main(String args[]) {

Manager mgr = new Manager();

Developer dev = new Developer();

System.out.println("Enter the manager details");

mgr.readMgr();

System.out.println("Enter the developer details");

dev.readDev();

System.out.println("Manager details ");

mgr.disMgr();

System.out.println("Developer detils");

dev.disDev();

}

}

Has a relationship

1. Association
2. Aggregation
3. Composition

class A {

B obj1 = new B(); zero, 1 or many

}

class B {

A obj2 = new A(); zero, 1 or many

}

class Employee {

Address add = new Address();

}

class Address {

}

Aggregation is a type of association but it is known as weak association.

class Student {

StudentHistory sh = new StudentHistory();

}

class StudentHistory {

}

Composition is a type of association but it is known as strong association.

Polymorphism : One name many forms or many implementation

Compile time polymorphism

: Method overloading or static binding or early binding

Run time polymorphism

: Method overriding or dynamic binding or late binding

Method overloading : the method have same name but different parameter list. Number of parameter or type of parameter must be different. We can achieve method overloading in same class.

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

To achieve overriding we need inheritance.

Method overloading example

class Operation {

void add(int x, int y) {

System.out.println(x+y);

}

void add(float x, float y) {

System.out.println(x+y);

}

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

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

}

void add(String s1, String s2) {

System.out.println(s1+s2);

}

}

class MethodOverloading {

public static void main(String args[]) {

Operation op = new Operation();

op.add(1,2,3);

op.add(1,2);

op.add(10.10f,20.20f);

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

}

}