Day 1

20-09-2022

Software

Application software : This type of software mainly use to develop the application.

System software : Operating system : it is to run the machine. OS window, unix, linux etc.

Programming language :

C 1970

C++ 1980

Java 1990

Python

C#

JavaScript

Go lang

Etc

What is Java ?

Java is pure object oriented and platform independent programming language.

object : object is any real world entity.

Properties or state --🡪 have -🡪 name, age, weight, color, height etc.

Person

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

Bank

Place

Car

Customer

Employee

class : blue print of object or template of object.

syntax of class

class ClassName {

property or variable or fields

behavior – function / methods

}

IDE

class

Java software

JDK : Java Development kit : which help to develop the application

JRE : Java run time environment :which help to run the application.

javac ProgramName.java : to compile the program

java classname : it is use to run the program

Day 2

22-09-2022

Variables : variable is a name which hold value and value can change during the execution of a program.

a=10;

name =”Raj Deep”;

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

2 types

1. Primitive data types : it is use to store only value.
2. Non primitive data types or reference data type: it use to store value as well as reference of another value.

Primitive data types :

8 types

1. byte 1 byte : -128 to 127 range
2. short 2 byte
3. int 4 byte
4. long 8 byte : without decimal
5. float 4 byte
6. double 8 byte : with decimal
7. char 2 byte : any single character a to z or symbol or number
8. boolean 1 bit : true or false

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

1. Arithmetic operator : +, -, \*, /, %(remainder)
2. Conditional operator : >, >=, <, <=, ==, !=
3. Logical operator : && (and), || (or) , !(negation)

&& if all condition is true then result is true

|| if any condition is true then result is true

1. Assignment operator : =

int a=10;

int b = 40+60;

int c+d = 100+400; Error

1. Increment and decrement

int a=10;

a = a+1;

or

a++ increment the value by one

a= a-1;

or

a-- decrement the value by one

a=10;

c=30;

value a 10;

value c 30;

a = c; assigning the value of c in a variable

a == c; comparing the value of a and c

a = c+d; error

a+b == c+d comparing

Day 3

27-09-2022

Conditional statement

1. If statement

if(condition) {

true block

}

1. If else

if(condition) {

}else {

}

1. If else if
2. Switch statement

**If and else example**

class IfStatement {

public static void main(String args[]) {

int age = 25;

if(age>21) {

System.out.println("You can vote!");

}else {

System.out.println("You Can't vote");

}

System.out.println("Finish");

}

}

If else if program

class IfElseIfStatement {

public static void main(String args[]) {

int m1=70, m2=90,m3=50;

int total = m1+m2+m3;

int avg = total/3;

if(avg>90) {

System.out.println("A++ Grade");

}else if(avg>75) {

System.out.println("A Grade");

}else if(avg >65){

System.out.println("B Grade");

}else {

System.out.println("C Grade");

}

System.out.println("Thank You!");

}

}

switch : in switch user can take decision which block want to execute.

Syntax

switch(variableName){

case label1: block1;

break;

case label2: block2;

break;

case label3: block3;

break;

default : defaultblock

break;

}

switch, case, break and default are keywords

in Switch we can use variable of type int or char or String etc.

class SwitchStatement {

public static void main(String args[]) {

int choice = 5;

switch(choice) {

case 1: System.out.println("First block");

System.out.println("First block finish");

break;

case 2: System.out.println("Second block");

System.out.println("Second block finish");

break;

case 3: System.out.println("Third block");

System.out.println("Third block finish");

break;

default : System.out.println("Wrong choice");

break;

}

System.out.println("Finish");

}

}

Taking the value through keyboards in Java

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

Scanner : Scanner is pre-defined class part of util package which provided lot of pre defined methods which help to take the value through keywords.

Syntax to create the Scanner class object

Scanner sc =new Scanner(System.in);

sc.nextByte();

sc.nextShort()

sc.nextInt()

sc.nextLong();

sc.nextFloat();

sc.nextDouble();

sc.nextBoolean();

sc.nextChar() no methods

Scanner class with switch statement

import java.util.\*;

class InputValue {

public static void main(String args[]) {

Scanner sc = new Scanner(System.in);

/\*System.out.println("Enter the value of a");

int a = sc.nextInt();

System.out.println("Enter the value of b");

int b = sc.nextInt();

int sum = a+b;

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

//System.out.println("Value of a is "+a);

int choice,a,b,sum,sub;

System.out.println("1:Add 2:Sub");

System.out.println("Plz enter your choice");

choice = sc.nextInt();

switch(choice) {

case 1: System.out.println("Enter the value of a");

a = sc.nextInt();

System.out.println("Enter the value of b");

b = sc.nextInt();

sum = a+b;

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

break;

case 2: System.out.println("Enter the value of a");

a = sc.nextInt();

System.out.println("Enter the value of b");

b = sc.nextInt();

sub = a-b;

System.out.println("Sub of two number is "+sub);

break;

default : System.out.println("Wrong choice");

break;

}

System.out.println("Finish");

}

}

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

While loop

Do while loop

For loop

Initialization : start and end position

Condition : true

Body of the loop

Increment or decrement the value

While loop

Initialization

while(condition) { entry loop

do the task

increment or decrement

}

Do while loop

Initialization

do {

do the task

increment or decrement

}while(); exit loop

For loop

1 2 4

for(initialization;condition; increment/ decrement) {

body of for loop 3

}

Initialization only once

Check the condition if condition is true then body of the loop and increment or decrement and then again check the condition till condition become false. – 2,3,4

Day 4

29-09-2022

Reference data types : it is use to store the value as well as reference of another data type.

array

class : user defined or pre-defined class

interface : user defined or pre defined interface

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

int a=10;

syntax to declare the array

datatype arrayName[];

int abc[]; // array declaration

int xyz[]={10,20,30,40,50,60}; // array declaration with memory creation array index position start from zero.

System.out.println(a);

System.out.println(xyz);

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

System.out.println(xyz[1]);

System.out.println(xyz[2]);

Array example

class ArrayDemo {

public static void main(String args[]) {

int a=10;

a=20;

int abc[];

int xyz[]={10,20,30,40,50,100,12,34,54,34,23,56,78,90,45,67,100,10,200,300,400};

System.out.println(a);

//System.out.println(xyz);

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

System.out.println(xyz[1]);

System.out.println(xyz[2]);

System.out.println("Size of the array "+xyz.length);

System.out.println("Retrieve the elements from array using loop");

int searchNumber = 10;

int flag = 0;

for(int i=0 ; i<xyz.length ; i++){

//System.out.println(xyz[i]);

if(searchNumber ==xyz[i]){

flag++;

//break;

}

}

if(flag>0){

System.out.println("Element is present and it present number of times are "+flag);

}else {

System.out.println("Element not present");

}

}

}

Syntax for array memory creation

datatype arrayName[]=new DataType[size];

int abc[]=new int[10]; default 0

float xyz[]=new float[20]; float 0.0

class ArrayMemoryCreation {

public static void main(String args[]) {

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

int num[]=new int[10];

System.out.println("Size of array is "+num.length);

System.out.println("Size of array is "+abc.length);

System.out.println("Value in zero index position "+num[0]);

System.out.println("Value in 2 index position "+num[2]);

System.out.println("Value in 9 index position "+num[9]);

//System.out.println("Value in 10 index position "+num[10]);

num[0]=100;

num[1]=200;

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

System.out.println(num[1]);

}

}

import java.util.\*;

class ArrayMemoryCreation {

public static void main(String args[]) {

/\*int abc[]={100,200,300,400};

int num[]=new int[10];

System.out.println("Size of array is "+num.length);

System.out.println("Size of array is "+abc.length);

System.out.println("Value in zero index position "+num[0]);

System.out.println("Value in 2 index position "+num[2]);

System.out.println("Value in 9 index position "+num[9]);

//System.out.println("Value in 10 index position "+num[10]);

num[0]=100;

num[1]=200;

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

System.out.println(num[1]);\*/

Scanner obj = new Scanner(System.in);

System.out.println("How many number do you want store");

int n = obj.nextInt();

int num[]=new int[n];

System.out.println("Plz enter number one by one");

for(int i=0;i<num.length;i++) {

num[i]=obj.nextInt();

}

int sum=0;

System.out.println("All elements are ");

for(int i=0;i<num.length;i++) {

//System.out.println(num[i]);

sum = sum + num[i]; // sum = 0+1, sum = 1+10

}

System.out.println("Sum of all numbers are "+sum);

}

}

String : String is a pre-defined or also known as reference data types.

Syntax to create the String class object.

String name = “Raj Deep”;

String msg = “Welcome to Java Training”;

import java.util.\*;

class StringDemo {

public static void main(String args[]) {

/\*String name = "Raj Deep";

String msg = "Welcome to Java Training";

System.out.println(name);

System.out.println(msg);

Scanner obj = new Scanner(System.in);

System.out.println("Plz enter your name");

//String fname = obj.next(); // it is use to scan the value through keyword, only one word.

String fname = obj.nextLine(); // more than one word till hit enter key

System.out.println("your name is "+fname);\*/

Scanner obj = new Scanner(System.in);

System.out.println("How many names do you want to store");

int n = obj.nextInt();

String names[]=new String[n];

System.out.println("Enter the names one by one");

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

names[i]=obj.next();

}

System.out.println("All names are");

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

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

}

}

}

int num[][]={{1,2,3},{4,5,6},{7,8,9}}

num[0][0] -🡪1

num[0][1] 🡪2

num[0][2] 🡪3

num[1][0] 🡪 4

int marks [][]=new int[][]

1. Create the Java Application to store more than one students details like sid, sname,age.
2. Create another Java application to store more than one students details like sid, sname,age, marks(array of array).

Day 5

06-10-2022

OOPs : Object Oriented Programming system

object : object is any real world entity.

Properties or state -🡪 have -🡪 variables / fields

Person

Behavior -🡪 do/does -🡪 function / methods

Bank

Animal

Car

Customer

Employee

class : class is blue print of object or template of object or it is a user defined data type which help to create the object.

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

Method or function syntax

returnType methodName(parameterList) {

}

No return type and no passing parameter

void info() {

// coding …

}

Passing parameter but no return type

void add(int x, int y) {

int sum = x+y;

System.out.println(sum);

}

Passing parameter and return value

String sayHello(String name) {

// coding

return “Welcome user “+name;

}

int addNumber(int x, int y) {

int sum = a+b;

return sum;

}

User defined class with properties and behavior

class App {

public static void main(String args[]) {

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

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

innova.start("Innova");

innova.stop();

//System.out.println("Santro Car Details");

Car santro = new Car();

santro.start("Santro");

santro.appliedGear();

santro.stop();

}

}

class Car {

int wheel;

float price;

String color;

void start(String name) {

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

}

void appliedGear() {

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

}

void moving() {

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

}

void stop() {

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

}

}

Types of variable or fields

In Java variables are divided into 3 types

1. Instance variable
   1. The variable which declared inside a class but outside method is known as instance variable.
   2. The instance variable hold default value according to their data types example int family 0, float 0.0, boolean false, string null etc.
   3. Instance variable we can access in all method but method must be part of same class and method must be non static.
2. 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 variable within that block where it declared.
3. Static variable

class App {

public static void main(String args[]) {

Car ertiga = new Car();

//ertiga.carDetails();

ertiga.wheel = 4;

ertiga.color = "Gray";

ertiga.price = 1400000;

ertiga.carDetails("Ertiga Car Details");

Car innova = new Car();

innova.wheel = 4;

innova.color = "White";

innova.price = 2200000;

innova.carDetails("Innova Car Details");

}

}

class Car {

int wheel;

double price;

String color;

void carDetails(String name) {

int temp;

System.out.println(name);

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

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

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

}

}

Another example

class App {

public static void main(String args[]) {

int a=1;

System.out.println(a);

Car ertiga = new Car();

//ertiga.carDetails();

ertiga.wheel = 4;

ertiga.color = "Gray";

ertiga.price = 1400000;

ertiga.carDetails("Ertiga Car Details");

Car innova = new Car();

innova.wheel = 4;

innova.color = "White";

innova.price = 2200000;

innova.carDetails("Innova Car Details");

}

}

class Car {

int wheel;

double price;

String color;

void carDetails(String name) {

int temp=100;

System.out.println(name);

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

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

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

System.out.println(temp);

}

void display() {

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

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

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

//System.out.println(temp);

}

}

Day 6

11-10-2022

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

While creating a constructor we have to follow few steps.

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 memory.

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

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

class Abc {

Abc() {

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

}

void display() {

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

}

}

class ConstructorDemo {

public static void main(String args[]) {

Abc obj1 = new Abc();

obj1.display();

obj1.display();

Abc obj2 = new Abc();

obj2.display();

obj2.display();

obj2.display();

}

}

Parameterized constructor example

class Operation {

int a, b,sum; //a=0,b=0,sum=0

Operation() {

a=1;

b=2;

}

Operation(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 ConstructorDemo1 {

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.add(); op3.display();

Operation op4 = new Operation(10,20); op4.add(); op4.display();

Operation op5 = new Operation(100,200); op5.add(); op5.display();

Operation op6 = new Operation(); op6.setValue(11,22); op6.setValue(111,222); op6.setValue(1111,2222); op6.add(); op6.display();

}

}

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

Example : class

If local variable and instance variable have same name then local variable hide the visibility of instance variable. So if we want to refer to instance variable this we have to use this.instancevaraible.

this is a keyword which refer to current object.

class Employee {

private int id;

private String name;

private float salary;

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

id = id1;

name = name1;

//salary = salary1;

if( salary1<0 ) {

salary = 8000;

}else {

salary = salary1;

}

}\*/

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

this.id = id;

this.name = name;

if(salary<0) {

this.salary = 8000;

}else {

this.salary = salary;

}

}

void display() {

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

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

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

}

}

class Encapsulation {

public static void main(String args[]) {

Employee emp1 = new Employee();

Employee emp2 = new Employee();

//emp1.id = 100;

//emp1.name = "Ravi";

//emp1.salary = -12000;

emp1.setValue(100,"Ravi",-12000);

emp2.setValue(101,"Ramesh",10000);

emp1.display();

emp2.display();

}

}

Another Example of Encapsulation

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 Encapsulation1 {

public static void main(String args[]) {

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

Employee emp2 = new Employee(2,"Ramesh",14000);

emp1.display();

emp2.display();

emp1.setSalary(15000);

emp1.display();

emp2.display();

}

}

Day 7

13-10-2022

**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 child class or derived class.

properties

behavior

}

Simple example of Inheritance

class A {

void dis1() {

System.out.println("A class dis1 method");

}

}

class B extends A{

void dis2() {

System.out.println("B class dis2 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 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 { } But this type of inheritance java doesn’t support. In Java one class can extends only one class at time. This type of inheritance java support using interface concept.

OOPs relationship

Two type of relationship

1. Is a relationship : generally this type of relationship we can achieve using inheritance.
2. Has a relationship : inside one class we have to create another class object.

class Employee {

id,name,salary

}

class Manager extends Employee{

numberOfEmp;

Address add = new Address();

}

class Programmer extends Employee {

projectName;

}

class ProjectManager extends Manager {

clientInfo;

}

class Address {

city,state

}

Manager/Programmer Is a Employee

ProjectManager is a Manager

Employee has a Address

Has a relationship

Association

Aggregation

Composition

Association : inside one class we have to create the object of another class to make association.

class A {

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

}

class B {

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

}

Aggregation : it is type o association which is known as weak association ie aggregation

class Employee {

Address padd = new Address();

Address ladd = new Address();

}

class Address {

}

Composition : it is a type of association which is known as strong association ie composition

class Student {

StudentHistory sh = new StudentHistory();

}

class StudentHistory {

}

Day 8

19-10-2022

Polymorphism :One name many forms or many implementation

2 types

1. Compile time polymorphism

Static binding or early binding

Method overloading : The method have same name but different parameter list ie type of parameter list as well as number of parameter list must be different.

Example

class Operation {

void add(int x, int y) {

System.out.println(x+y);

}

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

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

}

void add(double x, double y) {

System.out.println(x+y);

}

void add(String x, String y) {

System.out.println(x+y);

}

}

class MethodOverloading{

public static void main(String args[]) {

Operation op = new Operation();

op.add(1,2,3);

op.add(1,2);

op.add(10.10,20.20);

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

}

}

Find area of triangle, circle and rectangle. Method name must be area using method overloading.

1. Run time polymorphism

Dynamic binding or late binding

Method Overriding : The method have same name and same signature (number of parameter list, type of parameter list and return type must be same). If we want to achieve method overriding then we have to use inheritance.

Method overriding example

class Bike {

void speed() {

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

}

}

class Honda extends Bike { // re-usability

void color() {

System.out.println("Gray");

}

}

class Pulsar extends Bike {

void speed() { // override the code don't like

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

}

void color() {

System.out.println("Black");

}

}

class Tvs extends Bike {

void color() {

System.out.println("Red");

}

void speed() {

super.speed(); // merge the code super class and its own code.

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

}

}

class MethodOverriding {

public static void main(String args[]) {

Honda hh = new Honda();

System.out.println("Honda bike details");

hh.color();

hh.speed();

Pulsar pu = new Pulsar();

System.out.println("Pulsar bike details");

pu.color();

pu.speed();

Tvs tv = new Tvs();

System.out.println("Tvs bike details");

tv.color();

tv.speed();

}

}

In same example add mileage method,

Same example try to do with Bank, Hdfc, Hsbc, Sbi

Abstract keyword

1. abstract is a keyword we can use with method and class but not with variable.
2. Abstract method : method without body or incomplete method or without curly braces is known as abstract method.

abstract returnType methodName(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.

abstract class Demo {

}

1. Whichever class extends abstract class that class must be provide the body for all abstract method belong that class mandatory. That class can ignore only if that class itself is an abstract class.
2. Abstract class we can’t create the object.
3. Abstract class can contains normal as well as abstract methods. It can contains zero or 1 or may abstract method.
4. Abstract class without abstract method use we can’t create the object of that class.

abstract class Bike {

abstract void speed();

}

class Honda extends Bike{

void color() {

System.out.println("Gray");

}

void speed() {

System.out.println("50km/hr");

}

}

class Pulsar extends Bike {

void color() {

System.out.println("Black");

}

void speed() {

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

}

}

class AbstractKeyword {

public static void main(String args[]) {

Pulsar pu = new Pulsar();

pu.speed();

Honda hh = new Honda();

hh.speed();

}

}