Day 1 : 21/10/2023

Backend technology -→ Java and connecting database using JDBC.

	Java	
Core Java		
J2SE	J2EE	J2ME
JavaSE	JavaEE	JavaME
JSE	JEE	JME
Java Standard Edition	Java Enterprise Edition	Java Micro Edition
Desktop application	Servlet and JSP : web application	
Console base application	We will teach how to create	
Basic Java Programming	Rest API	
OOPs Concept	those rest api we will	
Object,	call in angular	
Class,	maven build tools	
Exception handling		
Collection Framework with Data structure		
JDBC topic to connect MySQL		
Java8(Lambda Expression and Stream API)		
and 11 and 15		
Regex		
Java 22		

Intro to Mongo DB

No SQL Database

Using Java we can connect to database using

1. JDBC
2. ORM -→ Hibernate and JPA.
3. Using Core Java, Servlet /JSP we can use JDBC or Hibernate or JPA.
4. Spring Framework we can use JDBC or Hibernate or JPA.
5. In Spring boot JDBC or JPA or Spring Data.

Phase 3 or Course 3

Spring framework and Spring boot

Junit 5 testing tool

Course 4 : Testing and deployment

Testing

TestNG, Selenium,

Docker, CI and CD using Jenkin, Overview of AWS

In AWS we will teach you how to deploy application in EC2 instance using Docker with CI and CD tool ie Jenkin

Frontend -→ angular

Backend → spring boot

Database -→ MySQL

Day 2 : 22/10/2023

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

Java develop in nov 1995. The initial name of java is Oak.

Version of Java

Java 1.0,1.1,1.2 7, 8,9,11,15 22

Java is an open source.

From java 11 onward java is not open source.

Java was belong to sun micro system

Now it is part of oracle.

Oops

object : object is any real world entity. Example

property or state or variable -→ have → variable, fields etc

name, age, weight, height, colour etc.

int, float, char, double, string etc.

Person

Behaviour or function or methods -→ do/does → function or methods.

Teaching(), sleeping(),talking(), typing(), etc

Bank

Animal

Car

Customer

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

Syntax of class

```
class ClassName {
        fields or variable declaration
        method or function declaration
}
class Demo {
    main method : pre defined methods.
}
```

Class name must follow pascal naming

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

Syntax to write method in java

```
returnType methodName(parameterList) {
    Method body;
}
```

```
void display() {


}
```

Method name is display no passing parameter and no return type.

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


}
```

Method name is add. We need to pass two parameter of type int but no return type.

```
String sayHello(String name) {
        return “Welcome user “+name;
}
```

Method name is sayHello. Need to pass one parameter of type string and return string value

In java all method must part of class.

```
class Test {
        public static void main(String args[]) {
                System.out.println(“Welcome to Java”);
        }
}
```

Method name and variable name must be follow camel naming rules.

1. If variable name or method name one world. Then it must be in lower case. Like main(), sleeping(), display(), read() etc and id, name,salary etc.
2. If variable name or method name more than one world then from second world first letter upper case like displayInfo(), calSalary(), empId, etc.

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

a=10; python

var b=20; js

let c:number =30; ts

datatype variableName;

datatype variableName=value;

In java data types are divided into two types.

1. Primitive data types :it is use to store only value
   8 types
   a. byte 1 byte -128 to 127
   b. short 2 byte
   c. int 4 byte
   d. long 8 byte
      without decimal point
   e. float 4 byte
   f. double 8 byte
      with decimal point
   g. char 2 byte in single character
   h. boolean 1 bit true or false value

Operator :

1. arithmetic operator : +, -, *, /, %
2. logical operator : &&, ||, !
3. conditional operator : >, <, >=, <=, ==, !=
4. assignment operator =
5. increment and decrement operator : ++, --

if statement

a. simple if
b. if else
c. if else if
d. switch statement

syntax of switch statement

```
int label =1;
switch(variableName) { variable type must be int, char or string in java.
case 1:block1
        break;
case 2:block12
        break;
case 3:block3
        break;
case 4:block4
        break;
default : default block ;
        break;
}
```

Looping : looping is use to execute the task or statement again and again repeatedly Till the condition become false.

Initialization

Condition

Task

Increment and decrement.

a. While loop : entry loop
b. Do while loop : exit loop
c. For loop

Type casting :

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

Two type of type casting.

a. Implicit type casting
b. Explicit type casting

int family

----------→ implicit type casting -----→

byte short int long

←---------- explicit type casting ----------

int to float implicit

float to int explicit

in java by default every decimal number double consider.

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

4 types of non primitive

1. array :array is user defined or reference data type which help to store same type of values.
   In java array is known as fixed in memory size.
   datatype arrayname[]; array declaration
   int num[];
   int a;

   int num1[]={10,20,30,40,50}; array declaration with initialization

   array memory creation syntax
   datatype arrayname[]=new datatype[size];

   int num2[]=new int[10];
   num2 can hold 10 value. Start from 0 to 9 position.

Taking the value through keyboard in java

Using Scanner class.

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

Package is a collection of classes as well as interfaces.

We need to create Scanner class object.

Syntax to create Scanner class object

```
Scanner obj = new Scanner(System.in);
```

While creating scanner class object we will get error. Because Scanner class part of util Package. We need to import it.

2. class

Scanner : pre defined class which help to scan the value through keyboard.

String : in Java String is a pre defined class. which help to store more than one Character in double quote.

String is pre defined class part of lang package.

By default java imported lang package.

3. interface
4. enum

in Ts or JS

```
class Customer {
}
var obj1 = new Customer();
let obj2=new Customer();
Scanner obj1 = new Scanner(System.in);
obj.nextInt(); int value
```

obj.next() string value

obj.nextFloat() float value

Day 3 : 28/10/2023

Java OOPs concept

object : any real world entity.

Property or state -→ have -→ variable or fields.

Person

Behaviour -→ do/does -→ functions or methods

Bank

Car

Animal

Customer

Employee

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

Method or function syntax

return type methodName(parameterList) {

}

```
void info() {
        coding….
}
```

Method name is info. For this method we are not passing any parameter while calling

And this method doesn't return any value to caller method.

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


}
```

Method name is add while calling this method we need to pass 2 parameter of type int and not return type.

```
String sayHello(String name) {
        Coding
        return “Welcome to my method user “+name;
}
```

Method name is sayHello. We need to pass one parameter of type string and it return string value to caller method.

Fields or variable.

In Java variable or fields are divided into 3 types.

1. Instance variable
   a. The variable which declared inside a class but outside method including main method also is known as instance variable.
   b. Instance variable hold default value base upon their data types.
      Int family →0
      Float family →0.0
      Char -→ space or white space
      Booean –> false
      String → null
   c. Instance variable we can use all method directly but method must be part of same class and it must be non static.
2. Local variable
   a. The variable which declared inside a method is known as local variable.
   b. Local variable doesn’t hold default value we have to initialize.
   c. The scope of the variable within that method where it declared.
3. Static variable

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 no return type not even void also.
3. Constructor get call automatically whenever we create the object that class.

```
class Employee {
        Employee() {}                   in Java Constructor
        constructor(){}                 in typescript or angular
}
```

innova

santro

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

If we want to refer to instance variable this we need to use this keyword. this is a keyword which refer to current to object.

Parameter constructor

Encapsulation : binding or wrapping data or variable and code or method/function is single unit is known as encapsulation.

Example : class.

JavaBean class

Inheritance :

Inheritance is use to inherits or acquire the property and behaviour of old class to new class.

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

property

behaviour

}

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

property

behaviour

}

Types of inheritance

1. Single inheritance : one super class and one sub class
   class A { }
   class B extends A { }
2. Multilevel inheritance : one super class and n number of sub class connected one by one.
   class A { }
   class B extends A { }
   class C extends B { }
   class D extends C { }
3. Hierarchical inheritance : one super class and more than one sub class connected directly to super class.
   class A { }
   class B extends A { }
   class C extends A { }
   class D extends A { }
4. Multiple inheritance : more than one super class and one sub class
   class A { }
   class B { }
   class C extends A,B { } Java doesn't support multiple inheritance. Error
   this type of inheritance in java we can achieve using interface.

```
class Employee {
        id,name,salary
        readEmployee()
        displayEmployee();
}
class Manager extends Employee {
        numberOfEmp;
        readManager()
        displayManager();
}
class ProjectManager extends Manager{
        clientInfo
        readProjectManager()
        displayProjectManager();
}

class Developer extends Employee{

        techName;

        readDeveloper()

        disDeveloper()

}
```

Day 4 : 29/10/2023

Scanner is a pre defined class part of util package.

Outside a class we need to import java.util.Scaner;

```
Scanner sc = new Scanner(System.in);

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

Int id = sc.nextInt();              to scan int value

String name = sc.next();            to scan string value but only one world.

String msg = sc.nextLine();         it take more than one world till hit enter key.

float salary = sc.nextFloat();
```

Polymorphism : one name many forms or many implementation.

2 types

1. Compile time or static binding or early binding
   Example : Method overloading :
   In C++ Operator overloading is example of compile time polymorphism
   The method have same name but different parameter list ie type of parameter list or number of parameter list must be different.
2. Run time or dynamic binding or late binding
   Example : Method overriding
   The method have same name and same method signature (number of parameter list, type fo parameter list and return type must be same).
   To achieve method override we need inheritance.

Annotation : annotation is like a meta data . meta data is data about data.

Annotation is like a decorator in angular.

Java provided lot of pre defined annotation. All annotation start with pre fix @ followed by annotation name. few annotation we can use on class level or method level or property level.

@Override. This annotation we can use on method level of sub class. if sub class method

Overriding super class method then we doesn't get any error else we will get the error.

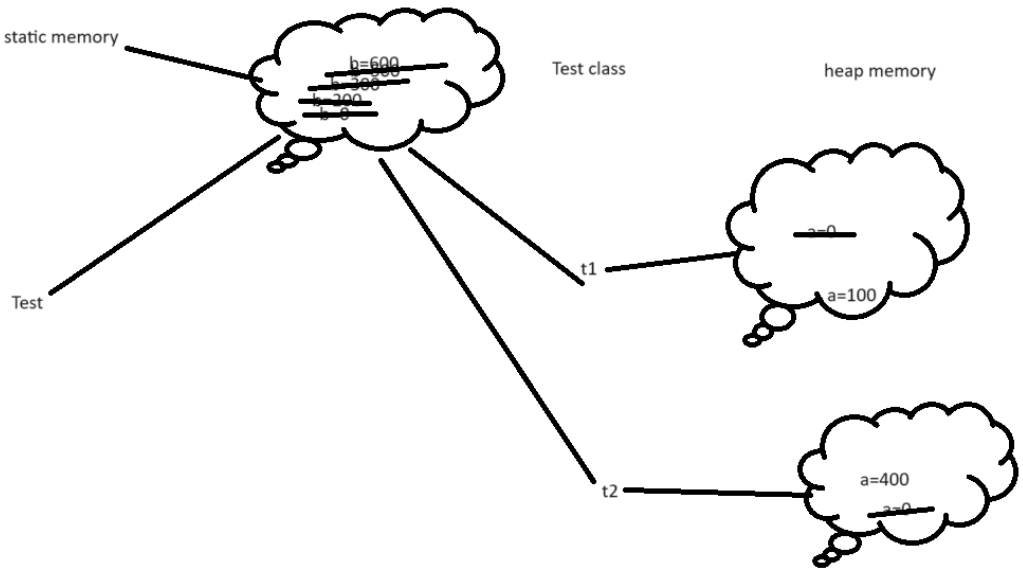
Non access specifiers keywords.

Java provide 3 non access specifiers keywords.

1. abstract :abstract is a keyword we can use with method and class but not with variable.
   a. Abstract method : method without body or without curly braces or incomplete method is known as abstract method.
      abstract returnType methodName(parameterList);
   b. If class contains one or more abstract method that class we need to declare as abstract class.
      abstract class classname{

      }
   c. Whichever class extends abstract class that class must be provide the body for all abstract method belong to that class mandatory.
   d. Abstract class can contain normal as well as abstract method. Means it can contains zero or 1 or many abstract methods.
   e. Abstract class we can't create object.

2. final : final keyword we can use with variable, method and class.
    a. final variable : to declare constant value in java we use final keyword.
       final int A=10;
       A=20; error
    b. final method : if method is final we can't override that method. But we can use that method.
    c. Final class : if class is final we can't inherit that class or extends that class.
3. static : static keyword we can use with variable and method but not with class.
    a. static variable : if variable is static we can access or assign the value of variable using class name.
    b. static method : if method is static we can call that method with help of class name.
    c. we can access static variable using object also as well as we can call static method with help of object also.
    d. Inside non static method we can access both the type of variable directly but inside static method we can access only static variable directly.
    e.



interface : interface is a type of reference data type. It is also known as

100% pure abstract class.

Syntax for interface

```
interface interfaceName {
        variables;
        methods;
}
```

By default all variable inside a interface are public ,static and final.

By default all methods in interface are public and abstract.

```
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 Test implements Abc,Xyz {
        dis1() and dis2() methods.
}
```

Like a class one interface can extends another interface as well as interface can extends more than one interface but class can't.

Class always implements interface. Class can implements more than one interface.

Which ever class implements any interface that class must be provide the body for all those methods belong that interface.

Interface Vs Abstract class.

1. Abstract class can contains normal as well as final variable but interface contains only final variable.
2. Abstract class can contains normal as well as abstract method but interface contains only abstract method.
3. Normal class can extends only one abstract class but normal class implements more than one interface.
4. Abstract class can contains default constructor as well as we can write empty or parameter constructor but interface doesn't contains any constructor.
5. Using abstract class we can achieve partial abstract but using interface we can achieve 100% abstraction.

Common point we can't create object of interface as well as abstract class.

Class extends class only one

Interface extends interface more than one

Class implements interface more than one

Interface can't extends or implements to class.

```
abstract class Bank {
    abstract void withdraw();
    abstract void deposit();
    void rateOfInterest() {
    }
}
```

Or

```
interface Bank {
    void withdraw();
    void deposit();
    void rateOfInterest();
}
```

Package and access specifiers

Package is a collection of classes and interface which have same name but different purpose.

In java package are divided into 2 types.

1. User defined package.
2. Pre defined package.

To create the package we need to use

package packagename;

school

Attendance

School student

college

Attendance

College student

Package is like a directory or folder

Access specifiers

Using access specifiers we can provide the visibility of variable, method and class part of same package or other package.

Java provided 4 types of access specifiers

1. private: we can use this access specifier with what
   we can use private with instance variable, static variable, non static method, static method, constructor but not with local variable as well as class.
   scope : within a same class.
2. default or nothing : we can use this access specifier with what
   we can use with all
   scope : within a same package

3. protected : we can use this access specifier with what
   we can use private with instance variable, static variable, non static method, static method, constructor but not with local variable as well as class.
   scope : within a same class as well as other package if it is sub class

4. public : we can use this access specifier with what
   we can use private with instance variable, static variable, non static method, static method, constructor, class but not with local variable.
   scope : same package well as other package.

Day 5 : 04/11/2023

Java bean class

1. class must be public
2. all variable must be private
3. for each variable you need to provide setter and getter method.
4. setter set the value and getter get the value.
5. Setter you can write with conditions if you need .
6. If you want provide empty as well as parameter constructor rather than setting value through setter methods.

```
public class Customer {

private int cid;

private String cname;

public void setId(int cid) {

    this.cid = cid;

}

public int getCId() {

    return this.cid;

}

}
```

Pre defined packages.

java	javax	root package
lang	sql	
io	swing	
util	servlet	
sql	ejb	
net	jms	
awt	net	
etc	etc	

by default every java program imported lang package.

So we can use all the classes and interface part of lang package without imported

Explicitly

String

System

By default every java program it may be pre defined or user defined internally extends

Object class.

Super API (application programming interface).

Exception handling

Exception is an object or memory which generate when unexpected or abnormal thing happened during the execution of a program.

Using some technique we need to handle generate exception that is known as exception handling.

Java program

Compile program

javac Demo.java

compile time error

syntax error

or typo error

after compile program

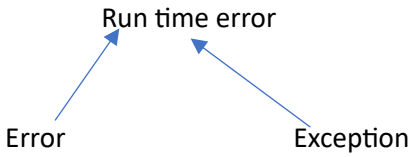
successfully it generate .class file.

Which contains byte code.

Run the program

java Demo

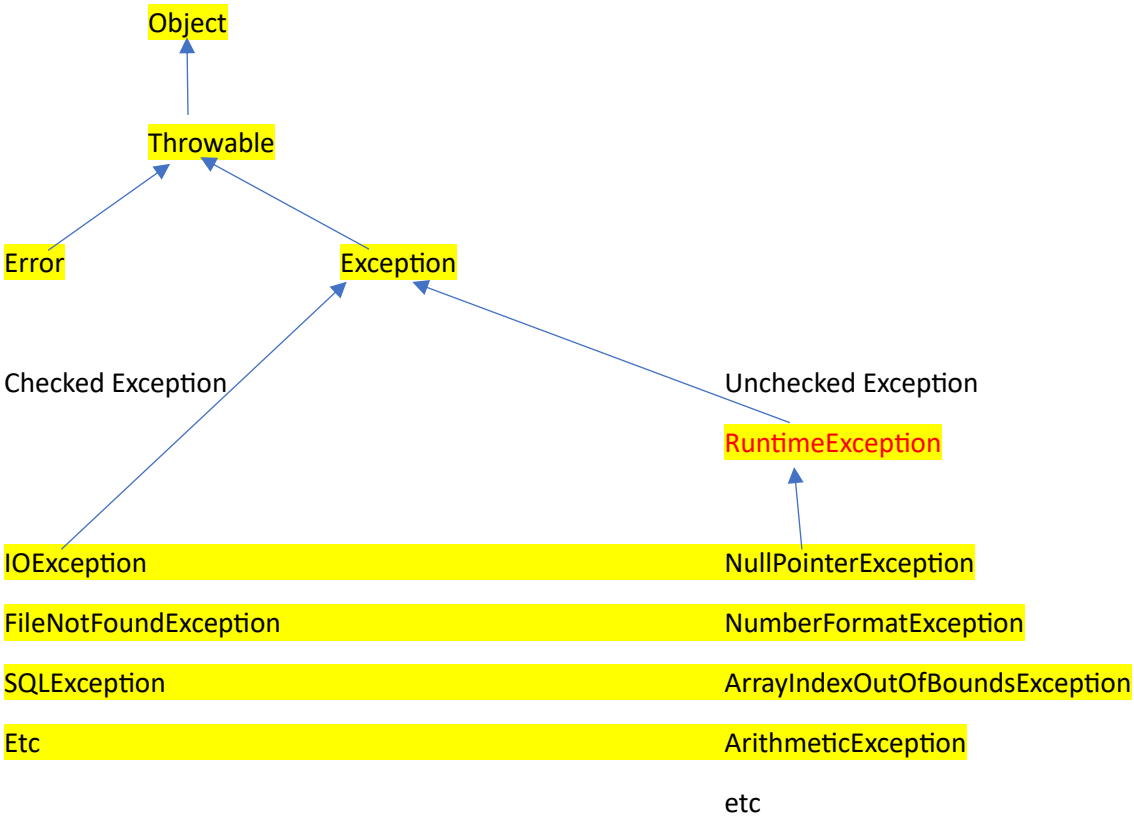
run time error



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

Error : The error which generate at rum time which we can't handle it. JVM crash, software or hardware issue, out of memory.

Exception : The error which generate at rum time which we can handle it. Divided by Zero.



To handle both the type of exception java provided 5 keyword.

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

we will handle un checked exception using try catch block

syntax

```
try {


}catch(Exception e) {


}
```

Try with multiple catch block

1. try with single catch block : if any exception generate we want to perform common task. Then try with single catch block advisable. In this option is good if we don't which code generate which type of exception.
2. try with multiple catch block : base upon type of exception we want to execute set of code then we need to use try with multiple catch block. In this option you must be know which code generate what type of exception.

```
try {

}catch(ArithmeticException e) {

}catch(ArrayIndexOutOfBoundsException e) {

}
```

finally keyword or block.

try block : the code which may generate the exception we need to keep in try block.

It one line code or more than one line code.

catch block : this block execute if any exception generate. No exception no catch block.

finally block : it is a type of block which will execute 100% sure if any exception generate of not.

try

catch	catch	catch	catch	finally
	catch	finally	catch	
	catch		catch	
			finally	

file handing program

database connectivity program

```
try {
        open the file
        read and write operation

}catch(Exception e) {

}finally {
        Close my resources ie file handling or database connection.
}
```

throw: throw keyword is use to raise or generate any pre defined or user defined (customer exception) depending upon the conditions.

Syntax

```
throw new Exception();
```

or

```
throw new ExceptionSubClass();
```

by default every sub class constructor contains super() parameter.

super() parameter is use to call super class empty constructor.

throws : throws keyword we use with method signature to throw the exception to caller method.

```
void display() throws Exception, ExceptionSubClass {

}
```

Sleep() method throw checked exception.

If method throw checked exception e need to handle it mandatory otherwise we can't compile program. Checked exception we can't avoid we need to handle using try catch or throws mandatory. Unchecked exception can avoid some extends.

So checked exception check twice compile time as well as run time.

Multi threading

Program : set of instruction to perform specific task.

Processor : Processor is responsible to execute the code.

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

Thread : small execution of a process. Thread also known as light weighed process.

It takes less resource or memory of our machine. Process known as heavy weighted.

By default in java inside a main method default thread execute.

To check default thread details.

```
Thread t = Thread.currentThread();
```

Thread is a pre defined class part of lang package which contains currenThread static method which provide default or current thread details.

System.out.println(t); Thread[main,5,main];

Main -→ name of the thread

5→ priority of the thread

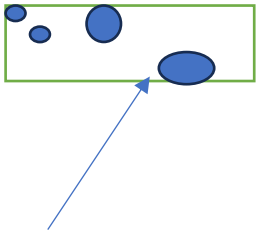
Main → group of thread

t.setName("My Thread");

t.setPriority(1); min 1 and max 10

we can set between 1 to 10 we can't set less than 1 or more than 10.

Multi tasking :



Task1 ---→ welcome to java traininasfasdfasffs

Task 2 -→

Task 3 -→

Copy and paste

C drive	D drive
D drive	E drive
E drive	F drive

Using process base

Using thread base

Multi tasking using thread base is faster than multi tasking is process base.

In java we can create more than one thread using lot of ways.

1. Using extends Thread class
    a. We need to create normal java class and that class must be extends Thread class.
    b. We need to create Thread class reference or object.
    c. With help of reference we need to call start() method. start() method is a pre defined method part of thread class. which help to start the thread.
    d. Start method internally call run() method. run method present in thread class.
    e. Run method part of thread class which contains empty body.
    f. If we want to do some custom logic we need to override run method and write the custom logic.
2. Using implements Runnable interface.
    a. We need to create normal java class and that class must be implements Runnable interface.
    b. Runnable interface contains one method ie run() method and this method is abstract.
    c. To start thread we need to start method.

d. But when our class implements Runnable interface we can't get start() method
e. So we need create Thread class object and pass the Runnable interface reference. And using thread class reference we can call start() method.
f. Start method internally call run method

Day 6 : 05/11/2023

Life cycle of thread

create ----→ runnable state → running state ---→ stop

obj1	obj1.start()	run	i = 10
t1	t1.start()	run	i = 10

isAlive() : check the status of thread

sleep() : to pause the flow the thread

wait() : to suspend the thread

notify() : resume the thread

notifyAll() resume more than one thread.

Task :

Pay the bill

Book the ticket

Transfer the amount etc

Synchronization : it is concept which help to block or lock the thread.

It is use to allow for only thread to use all resources at time.

To use synchronization concept java provided synchronized keyword.

This keyword we can use with method or inside a method we can use more than

Synchronized block.

wait(), notify() and notifyAll()

these three method use to do inner thread communication.

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

notify() method is use to resume or call back waited thread.

Pts

More than one thread created in same memory and method must be synchronized.

Task t1 = new Task(); Task t2 = new Task();

3 thread we will add 1 thread

Data -→ of type number

Consumer need to consume data of any type.

Producer need to produce the data.

Resource class

Resource object we will share to consumer and producer.

Consumer

Producer

Main class

Collection Framework (Data Structure)

Variable

int a=10;

a=20;

array

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

structure : it is a type of user defined data type which help to store more than one value of different types.

```
class Employee {
        int id
        String name
        float salary;
}
```

```
Employee emp = new Employee();
emp.id=100;
emp.name=”Ravi”;
emp.salary = 12000.50f;
```

array object

```
Employee employees[]=new Employee[100];
employees[0]=new Employee();
employees[1]=new Employee();
employees[99]=new Employee();
```

```
int abcd[]=new int[100];
```

Employee java bean class : id,name,salary, designation

Receive more than one employee details

And base upon designation update salary

If desg is manager 5000 bonus

If desg is developer 3000 bonus

Else

1500

Draw back of array object.

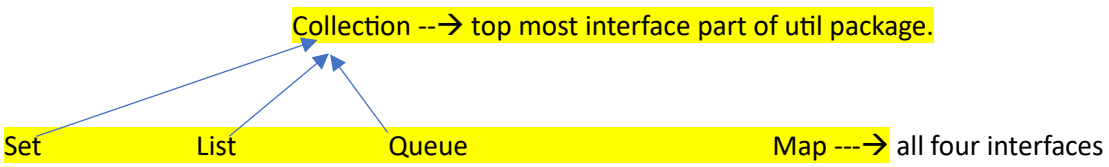
Array is known as fixed in memory size.

If we want to add or remove any data from array it is very complex.

Collection framework provided set of collection of classes which help to store collection of object of any type like int, float , char, double, string or user defined object.

It provided lot of pre defined method which help to add, remove, search, iterate very easily.

Collection framework hierarchy



Set, List, Queue internally extends Collection but map doesn't extends.

Set : it doesn't allow duplicate. Set doesn't provide index position to access the value.

HashSet,

LinkedHashSet

TreeSet

These top classes internally implements Set interface.

List : it allow duplicate. List allow index position

Stack

ArrayList

LinkedList

Vector

These top classes internally implements List interface.

Queue : by default first in first out feature provides

LinkedList

PriorityQueue

Map : it will allow to store information in key-value pairs. Key is unique and value can be duplicate. Using key we can get the value.

HashMap

LinkedHashMap

TreeMap

HashTable

Day 7 : 18/11/2023

HashSet : Unorder

LinkedHashSet : Order

TreeSet : sorting by default asc TreeSet internally implements SortedSet interface that interface provided logic do to sorting.

List API

Stack : Stack is a type of data structure which provide the features

push, pop, peek etc.

ArrayList Vs Normal Array

1. Normal array allow to store same type of values but array list by nature we can store any types of values.
2. Normal array fixed in memory size. ArrayList dynamic memory.
3. Normal array doesn't provide any method to do some operation. ArrayList provide lot of pre defined method to add, remove, search etc.

LinkedList

LinkedList is a type of List API which internally use Node to store the data.

Type of linked list

1. Singular linked list
2. Double linked list
3. Circular linked list

10 null null 10 null

Value ref pref value nref

By default java LinkedList consider as double linked.

1 2 to 100

0 pos 200 ---element in 1 post

LinkedList is good for insertion and deletion

ArrayList is good for retrieve operation

Vector : Vector is a type of legacy class. in Vector by default all method are synchronized.

Thread safe but slow performance.

Map : key – value : key can be unique and value can be duplicate.

HashMap	unorder
LinkedHashMap	order
TreeMap	asc order as key
Hashtable	by default method are synchronized.

Hashtable , HashMap

Retrieving the value from collection classes one by one

1. For each loop
2. Iterator – interface
3. ListIterator – interface
4. Enumeration – interface

Colletion framework with generics

```
//CollectionClass<type> object  = new CollectionClass<Type>();
```

Type can be Integer, Float, Character, Double, or any user defined objects. Like Employee, Customer, Manager etc.

Collection Framework with user defined objects.

Employee, Customer, Manager, Account etc.

Product -→ bean class variable, setter, getter, constructor etc

ProductService → service class which contains business logic

Add, remove, retrieve, update etc.

Service layer not to interact with input device. Don't take the value in service layer using scanner class. In simple don't use system.out.println("IN Service layer ");

Day 8 : 25/11/2023

JDBC

In VM

Open terminal

Write as

sudo mysql -u root -p

Simplilearn

JDBC : Java Database Connectivity : JDBC provided lot of pre defined API (application programming interface) which contains lot of classes and interfaces which help to connect database ie mysql or oracle o db2 etc using java technologies to do CRUD Operation ie create, insert, update, delete and retrieve etc.

Steps to connect the database.

1. We need to import java.sql or javax.sql package.
2. Jdbc always throw checked exception so we need to handle the exception using try-catch or throws mandatory.
3. Load the Driver. Driver is pre defined class provided by vendor whose database we are planning to connect.
   4 types of drivers.
   a. Type 1 or jdbc odbc bridge driver
   b. Type 2 or jdbc native api driver database dependent driver. Performance fast but database dependent.
   c. Type 3 or jdbc net protocol driver : we need server to connect the database. Ie data source
   d. Type 4 or jdbc thin driver or pure driver : we need to download jar files provided by vendor.

   From java 8 onward type 1 deprecated.

   Class.forName("drivername");

   Class is a pre defined class name itself is Class part of lang package. Which contains forName static method. which help to load the class or driver

   MySQL 5.x version com.mysql.jdbc.Driver

   MySQL 8.x version com.mysql.cj.jdbc.Driver

4. Connect the database.
   Connection con = DriverManager.getConnection(url,username,password);

   Connection is interface which provide set of method which help to give the reference of Statement or PreparedStatement.
   DriverManager is a pre defined class part of sql package. Which contains getConnection static method which takes 3 parameter
   1st url
   2nd username of database
   3rd password of database
   getConnection method return type is Connection interface reference.

5. Now we create Statement interface reference.
   Statement stmt = con.createStatement();

   Statement interface provided set of methods which help to do some operation.
   a. DML Operation : insert, delete and update

      int result = stmt.executeUpdate("DML Operation");
      if record inserted or deleted or updated result hold value > 0. Else for insert exception for delete or update zero.

b. DRL or DQL : select query

```
ResultSet rs = stmt.executeQuery("select clause")
while(rs.next()) {

}
```

Statement : Statement is use to execute static query

Using Statement if we execute any query. Query compile on java side send to database side and execute and get acknowledgement.

PreparedStatement : PreparedStatement is use to execute dynamic query. It support parameterized query concept.

Query compiles only once in java side and execute n number of time in database depending upon value.

```
Statement stmt = con.createStatement();
        stmt.executeUpate("DML")    or stmt.executeQuery("DRL");

PreparedStatement pstmt = con.prepareStatement("DML or DQL");
```

Limitation

1. Adding jar files manually in project
2. Every IDE follow their own project structure.
3. Creating documentation

Build tool : build tool is responsible to build the application. Compile the program, run program, creating jar, war , ear etc. adding jar file or dependencies as well as maintaining the dependencies. Creating the documentation.

ANT

Maven

Gradle

Maven build tool.

Spring and Hibernate

So we can create maven project using command prompt as well as we can create using any IDE.

Group id : collection of more than one project

Artifact id : project name

Maven build tool use pom.xml file (project object model) this file contains all configuration details to build the application.

Maven goal

mvn clean	clean the project
mvn compile	compile all files
mvn test	testing
mvn package	creating jar or war or ear by default jar consider
mvn deploy	deploy the project in server

DAO layer : Data Access Object : this class contains more then one method which is responsible to write the JDBC code.

By default Every Java program extends Objects class.

Day 9 : 26/11/2023

Creating ProductManagementSystem app using maven tool with bean layer, service layer, dao layer, resource layer and main class.

In Database ie table	Programming language ie Java
Product table	Product → java bean
Pid, pname, price etc column	pid, pname, price, setter and getter method
	Constructor ie empty as well parameter etc

ProductDao Data Access Object

Which contains more than one method which help to do some operation using jdbc on product table. storeProduct, deleteProduct, updateProduct, retrieveProduct etc.

ProductService

This class contains more than business method

To storeProduct, deleteProduct, updateProduct, retrieveProduct etc.

Main class which contains main method interact with input device ie keyword.

If we display any user defined class reference in println it internally call Object class toString method.

That method return object in string format as packagename.className@code

If we want meaningful object then we need to override toString method in our user defined class.

resource layer

this layer contains resource details

like database connection, security, file handling details etc

Java 8 features

1. From java 8 onward interface can contains method with body.
   But we need to use the keyword as default or static.
   Whichever class implements any java8 interface that class must be provide the body for only abstract method not for default or static.
   If we want we can override default method but not static method.
   Default method as well as override default method we can call with the help of object of that class. The class which implements that interface.
   Static method part of interface we need to call through interfaceName.methodName.
   We can add more than one abstract , static as well as default.

   Bank interface
   Set of methods
   rateOfInterest : default implementation 8% or static 8%
   HDFC implements Bank
   HSBC implements Bank

   Collection -→ interface added any methods default methods
   Set List Queue

2. Functional interface : the interface must be contains only one abstract method it can contains more than one static as well as default but only one abstract that type of interface is known as functional interface.
3. Functional interface is use to achieve lambda expression.
4. Lambda expression Lambda expression is like anonymous function or method. using lambda expression we can achieve functional programming language features in java.

Syntax

InterfaceName objectRef = (parameterList)->statement

Java 11 features

Day 10 : 02/11/2023

InterfaceName objectRef = (parameterList)->statement

Lambda expression return data without return keyword.

It is equal to arrow function in JavaScript

```
Interface Bank {
        pubic float findBalance(int accno);
}
```

Java 8 provided lot of pre defined function interface which we use in Stream API.

Top four function interfaces are part of function package.

Function package sub package of util package.

Function

This interface contains one method ie appy it take T as parameter and return R value.

Supplier

This interface contains get method no passing parameter but return T value.

Consumer

This interface contains accept method passing T parameter but no return type.

Predicate

This interface contains test method takes T parameter and return boolean value.

Java 11 Features

1. In String class added few more new methods.
2. Inside lambda expression as well as anonymous class we can use var keyword to declare variable name or reference name.
3. File handling examples

Stream API :

Stream means flow of data.

Data structure is in memory data types.

Set, List, Map, Queue

In list we store 1000 records

List<String> names = new ArrayList();

names.add("Ravi"); names.add("Steven");

ListIterator li = names.listIterator()

Using Stream API we can load the data from any container ie array or collection and apply

Business logic like filter, mapping, sorting, etc on demand.

All business logic apply only for temporary purpose.

Container

Array ---------→Stream --→ Intermediate operator 1-→ Intermediate operator 2

Or ----------→ Intermediate operator 3----------→Terminal operator or function or methods

Collection of classes

Intermediate operator return type is stream it self. And terminal operator return type void, int, float, character or boolean

Java Web Application

Core java or J2SE **: We can create standalone or desktop application.**

AWT or Swing or Java FX **using theses package we can create gui application.**

JDBC

MySQL or Oracle

JavaEE or JEE : java enterprise edition using this module we can create web application.

http://www.google.com -→ URL (Uniform resource locator)

http/https----------→req

Client Server

Res←----------https/http

html or html5

Css/css3 or bootstrap

JavaScript to do client side Validation.

JEE (Servlet/JSP/EJB)

Java Server Page / Enterprise Java Bean

Asp.net

Php

Python

Node JS

Jee (Servlet /JSP/EJB)

Servlet, JSP and EJB are server side technologies.

These technologies don't' contains main method. we can need to compile and deploy these application in server.

Application point of view server mainly divided into 2 types.

1. Web Server : tomcat
2. Application Server : web logic, jboss, Web Sphere etc. IIS etc

In development mode we use web server

In production mode we use application server.

Inside a sever engine present ie we call as container. Container is responsible to load the class, create the object of servlet, jsp as well as ejb. Call life cycle method destroy objects.

Container is part of server.

If server is type of application server which contains only one type of container ie web container responsible to execute servlet and jsp.

If server is type of application server which contains more than one type of container ie web container, ejb container, jms container etc. it provide some extra service like connection pooling, thread management, resource management, security etc.

Day 11: 03/11/2023

Servlet : Servlet is normal java program which help to create dynamic web page on server side.

API (Application Programming interface).

servlet: servlet is package part of javax. Which contains set of classes and interfaces.

import javax.servlet.*;

Servlet :Servlet is an interface part of servlet package. This interface contains totally five methods.

init it call only once

service it call again and again whenever client send request to server

destroy it call at last when client close application life cycle methods. Automatically get called.

getServletInfo

getServletConfig

1st option

class MyServlet implements Servlet {

we need to override all 5 methods mandatory.

}

GenericServlet : it is a type of abstract class which internally implements Servlet interface. This class provided body for all methods except service methods.

2nd option

class MyServlet extends GenericServlet{

we need to override only service methods mandatory. If you want other methods we can override.

}

HttpServlet : it is a type of abstract class which internally extends GenericServlet and provided body for service method also as well as it provide few extra methods in the form of doXXX like

doGet

doPost

doPut

doDelete

etc

3rd option

class MyServlet extends HttpServlet {

service or doGet or doPost

}

http://locahost:8080/ProjectName/

by default html form method consider as get.

Get method call doGet method of Servlet.

If method is get information send through URL using url rewriting technique

URL?key=value one information

URL?key=value&key=value

If we want to make data secure then we need to use post method

Post method call doPost method. in post method information send through body part of request.

RequestDispatcher : it is an interface which help us to redirect from one page to another page.

The page can be servlet, html or jsp.

Syntax to create RequestDispatcher interface reference.

ReqeustDispatch rd1 = request.getReqeustDispatcher(“path”);

Path

Target page is servlet then path must be target servlet page url-mapping name.

Target pags is jsp or html then path must be target pagename.html or pagename.jsp

rd1.forward(request,reponse); we can see the output of target page.

Or

rd1.include(request,response); we can see the output of source + target page as merge one page

Servlet with JDBC Login App (SignIn and SignUp)