UNIT - V

⑥ Write short note angular JS. List advantages & disadvantages.

⇒ Angular JS

- It is a Javascript open-source front end web framework primarily maintained by google and a community of individuals and corporations.
- It is licensed under Apache license version 2.0. It's main purpose is to simplify both the development and the testing of single-page applications by providing a framework for client side MVC architecture.
- It extends HTML DOM (Document object model) with additional attributes. It is more responsive to user actions.

Advantages :

(i) MVC support :
It is based on model view controller (MVC) architecture which provides seperations of model, view and controller components.

(ii) Unit Testing :
The angular JS code is unit testable.

(iii) Reusable code :
Angular JS support for using the reusable components.

(iv) Less code :
It support for less code and more functionality

Disadvantages:

(i) As angular JS is based on Javascript framework, it is not secure

(ii) There are multiple ways to do same thing with Angular JS. Sometimes, it can be hard for novices to say which way is better for a task.

⑦ Write a short note on React JS. Enlist and explain the feature of it.

⇒

- React JS is a popular open-source JavaScript library developed by facebook for building UI, particularly single page applications where data changes over time.

- This library is responsible only for the view layer of the applications. That means this Java Script for building user interfaces.

- It allows developers to create large web applications that can update and render efficiently in response to data changes. React is known for its performance, flexibility and ease of use

- for eg. Facebook likes gets incremented without reloading the page.

Features:

(i) Virtual DOM :-

It uses a virtual DOM, a light weight copy of the actual DOM. When changes are made, React updates the virtual DOM first and then efficiently updates the real DOM, leading to better performance.

(ii) Components :

This feature allows the web developers to create custom elements which can be reused in HTML.

(iii) (Javascript XML) JSX :

JSX is an extension of Javascript syntax. It can be seen as a combination of Javascript & XML. The syntax of JSX is very simple that makes writing components very easy.

(iv) One-way Data Binding :

- React employs one-way data binding, which means data flow in a single direction from parent to child components. This make it easier to debug and understand the flow of data in an application.

Q8 State the term thread synchronization. Explain how to achieve thread synchronization in Java.

⇒ Thread synchronization :

- It refers to the process of coordinating the execution of multiple threads to ensure that they do not concurrently execute critical sections of code that access shared resources.
- This is crucial for preventing data inconsistencies, race conditions, and ensuring thread safety when multiple threads interact with shared data or resources.
- The synchronization is the concept which is based on monitor. monitor is used as mutually exclusive lock or mutex. When a thread owns this monitor at a time then the other threads can not access the resource. Othere threads have to be there in waiting state.

There are two ways to achieve synchronization:

(i) Using synchronized methods:

It ensures that only one thread can execute it a time for a given instance of the class. The entire method is locked on the instance ('this') for non-static methods or on the class object for static methods.

Program:

```
public class Counter {
    private int count = 0;

    public synchronized void increment() {
        count++;
    }

    public synchronized int getCount() {
        return count;
    }
}
```

exp In this increment method is synchronized so only thread can execute it at a time for any given instance of 'Counter'. This ensures that the 'count' variable is updated correctly even when multiple thread call 'increment' simultaneously.

(ii) Using synchronized Blocks:

It allow more fine-grained control over synchronization. Instead of synchronizing the entire method, you can synchronize only a specific part of method. This can lead to better performance because it reduces the scope of the lock, allowing other part of the method to be executed concurrently.

eg.

```
public class counter {
    private int count = 0;
    private final object lock = new Object();

    public void increment() {

        synchronized (lock) {
            count ++;
        }
    }

    public int get count() {
        synchronized (lock) {
            return count;
        }
    }
}
```

here we only lock 'specific "lock" object.

(12) write a Java script code to create login page form.

⇒

```
<html>
<head>
    <title> login Page </title>
</head>

<body>
    <h2> login </h2>

    <div id="error" class="errormsg"> </div>
```

```
<form id="loginForm" onsubmit="return validate()">
<input type="text" id="usr" placeholder="usr" req><br>

<input type="password" id="pass~~word~~"
    placeholder="Password" required><br>

    <button type="submit">login</button>

</form>

</html>
```

script:

```
<script>
    function validate() {

        document.getElementById("error").innerText
                = " "; // clear prev error msg.

        const usr = document.getElementById("usr").
                value;
        const pass = document.getElementById("pass~~word~~").
                value;

        if (usr === '' || pass === '') {
            document.getElementById('error').innerText =
            "please enter both username & password";
            return false;
        }

        if (usr == 'admin' && pass == 'sid') {
            alert ("login successfull");
            return true;
        } else
            alert("Invalid credentials");
            return false;
        }
</script>
```

PPL

Q1] Explain different ways to implement Threads in Java? Write code example

→

*** Creating Thread using Alive() and join():-**

- There are two method that are commonly used while handling more than one thread in java program and these method are is Alive() and join().
- the purpose of this two method is to check whether a thread has finished its execution or not.

*** isAlive() method:-**

Syntax:-

```
Public Final boolean isAlive()
```

*** Java Program:-**

```
Public class ThreadDemo extends Thread {
    public void run() {
        S.o.p.in("Begin");
        try {
            Thread.sleep(500);
        }
        catch (InterruptedException ie) {
        }
        S.o.pln("End");
    }
    Public S vm (String args[]) {
        ThreadDemo t1 = new ThreadDemo();
        ThreadDemo t2 = new ThreadDemo();
        t1.start();
        S.o.pln ("is thread alive?" + t1.isAlive());
        S.o.pln("is thread 2 alive?" + t2.isAlive());
```

```
t2.start();
S.o.Println("Now is thread 2 alive?" + t2.isAlive());
}
}
```

② The join() method:-

- This method wait until the thread on which it is called terminates.

* Syntax:-

Find void join() throws InterruptedException

Using join method, we tell our thread to wait until the specified thread completes its execution.

* Java Program:-

```
Public class ThreadDemo extends Thread{
    Public void run(){
        S.o.Pln("Begin");
        try{
        Thread.sleep(500);
        }
        Catch (InterruptedException e){
    }
}

PSVM(String args[]){
    ThreadDemo t1=new ThreadDemo();
    ThreadDemo t2= new ThreadDemo();
    S.o.Pln("Starting 1st thread");
    t1.start();
    try{
        t1.join() // waiting for t1 to
                    finish
    }
```

```
catch (InterruptedException e){
    }

    S.o.println("Starting another thread 2");
    t2.start();
  }
}
```

Q2] Explain the below method in details:-

1] isAlive:-

- Isalive method is used to check whether thread execution is going or not.
- It return boolean value
- Syntax:-

```
public final boolean isAlive()
```

* Java Program:-

```
public class threaddemo extends Thread{
    public void run(){
        S.o.p.ln("Run");

        try{
            Thread.sleep(500);
        }
        catch (InterruptException e){
        }
        S.o.println("End");
    }
    psvm (String args[]){
```

```
Threaddemo t1 = new Threaddemo();
Thread demo t2 = new Threaddemo();

    t1.start();

S.o.pln("Is thread1 alive" + t1.isAlive());
S.o.pln("Is thread 2 alive" + t2.isAlive());

    t2.start();

S.o.pln("Now Is thread 2 alive" + t2.isAlive());
}
}
```

② Notify :-

- In Java notify() method is used in with conjuction wait() method to manage inter process communication with synchonized method or block.

~~1. wait() and notify() :-~~

~~- These methods are used to cordinate activities~~

- Notify() method wake up one of thread that are waiting on object.

③ Get Priority() :-

- The Priority-vol is constant which denotes the priority to thread.
- It is defined as :-
  - MAX_PRIORITY = 10
  - MIN_PRIORITY = 1
  - NORM_PRIORITY = 5
- The function getpriority is used to get priority of thread.

Syntax:-

ThreadName.~~Priority()~~ getPriority();

CEDAL

3] List the Feature and advantage of limitation of Vue JS.

→

*Features of VueJS:-

1] Components:-

This Feature allows developer to create custom element which can be used in HTML.

2] Event Handling:-

Any event can be handled using VueJS script with help of v-on attribute

3] Data binding:-

This Feature help to assign values to HTML attribute or styles.

4] Animation:-

- VueJS help to show animation of element on webpage

5] Lightweight and Efficient:-

- VueJS is lightweight and effective java Frame.

* Advantage:-

EIPCS

① Ease of Learning:-

- Vue.js is designed in such a way that it is very easy to learn the one who is new to frontend can also easily learn this framework.

② Ease of Integration:-

- Vue.js can be easily integrated to existing project, allow developer to adopt it without rewritting.

③ Component-Based Architecture:-

- Vue.JS Follows a component based architecture which encourage building UI in modular and reusable way.
- Component can be easily reused over different part of application.

④ Performance:-

- Vue.JS is know for its excellent performance such as virtual Dom and efficient user experience.

⑤ Small Size:-

Vue.JS has small file size, making it fast to download especially for smaller project.

LSL

* Limitations of vue.js:-

① Less support:-
- As compared to reactJS, Angular vue.js has may have less cooperate backing and support.

② Scalability challenge:-
- As vue.js is suitable for small to medium sized projects, for large application vue.js is complex.

③ Learning curve for advance feature:-
- As vue.js is easy to start but learning the advanced feature such as rendering may require understanding of Framework and Resources.

4] Elaborate the term getPriority() and setPriority() method with example?

→ - In java threads have Priority, which are used by thread scheduler to schedule a thread.
- The Priority No is given from 1 to 10 where 1 is low Priority 10 is high Priority and 5 is normal Priority.

* getPriority():-
- This method is used to get the Priority of thread. It return an integer values representing Priority of thread.

* Syntax:-

Threadname.getPriority()

* Java code:-

```
Public class Threaddemo extends Thread {
        Public void run() {
            S.O.Pln("Thread running");
    }
    PSVM (String args[]) {
        Threaddemo t1 = new Threaddemo();
    int pr1 = t1.get Priority();
        S.O.Pln("Thread Priority :" + pr1);
    }
}
```

* setPriority():-

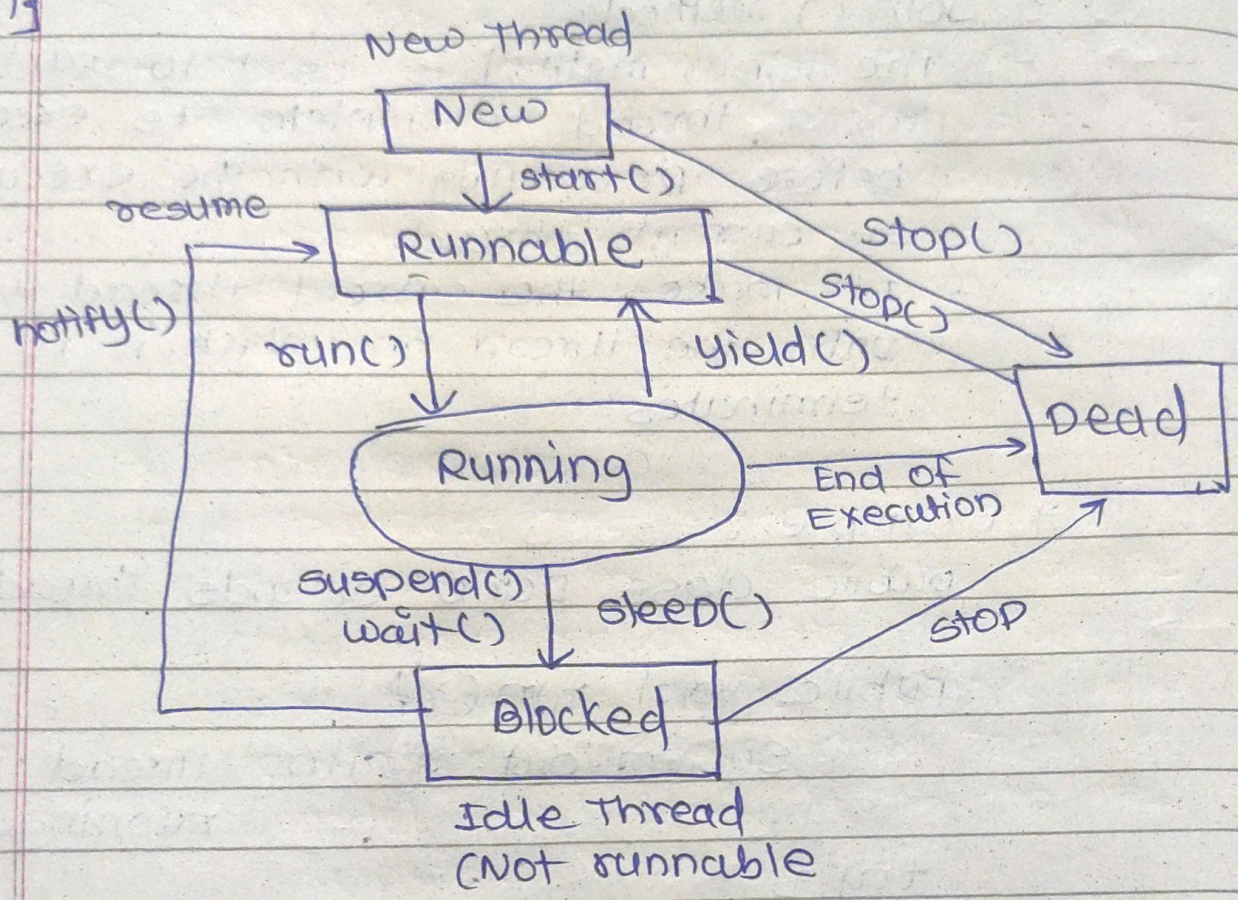
- This method is used to set Priority to thread specifying integer value.
- The integer value must be range between 1 to 10.
- when 1 is low Priority and 10 is high Priority.

```
Public Class Threaddemo extends Thread {
        Public void run() {
            S.O.Pln("Thread begin");
        }

    PSVM (String args[]) {
        Thread demo t1 = new Threaddemo();
        t1.setPriority(8);
        t1 ~~thread~~.start();
    }
}
```

* Thread life cycle

[17]



1. New :
   - when a thread is created It's in the New state.

2. Runnable :
   - After calling start() method the thread moves to the runnable state.
   - here thread is ready to run.

3. Running :
   - when thread get CPU time it moves to the running state and execute its task.

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6. Blocked : (Terminate)
Finally when the thread completes its task or is explicitly stopped it enters the terminated state and can't be started again.

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* Difference Multiprocessing and Multi-threading:

Multiprocessing	Multithreading:
1: Multiple processes runing at same time	1. Multiple thread with similar process run at same time.
2. Each process has its own memory space	2. Thread share the same memory space with proces
3. It is more complex	3. It is less complex
4 separete memory and resource for each process	4. share memory and resource with same process.
5. fault in one process does not affect other process	5. fault in one thread can affect the whole process.
6. suitable for CPU bound tasks	6. suitable for I/O bound tasks.
7. Multiple process execute at same time	7. Multiple thread run (execute) at same time in 1 process.

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* Interpret the term multitasking and multiprocessing and multithreading in Java with example.

* Multitasking :-
- Multitasking is the ability of an executing more than one task same time
- this mean's running multiple application at a same time.

- Example :-
Think of using web browser listening to music, and writting a document all at the same time.

- Example :
1. first Java Application (App1.java)

```
→ public class App1 {
        public static void main (String[] args){
            System.out.println ("App 1");
        }
    }
```

2. second Java Application (App2.java)

```
→ public class App2 {
        public static void main (String[] args){
            System.out.println ("App 2");
        }
    }
```

- we can run these two application at a same time from comand prompts.

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* Multiprocessing :-

- Multiprocessing refer to the ability of system to support more than one processor (CPU) allowing multiple processes to run same time.
- Each process can be executed on a different processor improving performance.

- Example :-
  Imagine you have a computer with two CPUs, one CPU could be handling your email application while the other CPU runs your web browser.

- Example :-

```
public class Multiprocessing {
    public static void main (String[] args){
    try {
        ProcessBuilder processBuilder1
        = new ProcessBuilder ("java", "-cp",
            "App1");

ProcessBuilder processBuilder2 = new Process-
    Builder ("java", "-cp", "App2");

        processBuider1.start();
        processBuider2.start();

    } catch (Exception e) {
        e.printStackTrace();
    }
}
}
```

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* Multithreading :-
- Multithreading is a programing concept where a single process can contain multiple threads of execution that run concurrently
- Thread within the same process share resources but execute independently.

* Example :

```
class Task1 extends Thread {
    public void run(){
        for (int i=0 ; i<5 ; i++) {
            system.out.println ("~~Task 1~~
                                count1: " + i);
        try {
            Thread . sleep (500);
        } catch ( Interrupted Exception e) {
            e.printstack Trace() ;
        }
    }
}
}

class Track 2 extends Thread {
    pubic void run (){
    for (int i=0 ; i<5 ; i++) {
        System.out.println ("count 2 : " + i);
    try {
        thread . sleep (500);
    } catch (Interrupted Exception e) {
        e. printstackTrace ();
    }
}
}
}
```

```
public class Multithreading Example {
    public static void main (string [] args) {
        Task1 t1 = new Task1 ();
        Task2 t2 = new Task2 ();

        t1.start ();
        t2.start ();
    }
}
```

* List the features of javascript and write a javascript program to display welcome message.

* features of Javascript :-

1. Dyanamic typing :
   Variable in javascript are not bound to any specific type which allow for flexibillity

2. object oriented :
   - It suport orject oriented enviroment allaoing reusable code.

3. First ~~calls~~ class fuction :
   - fuction in java script are first class fuction means they can assign to variable or pass as argument to another fuction.

4. Event handing
   - Javascript is well suitable for Event handing such as user Interaction, good feel's etc.

5. Lightweight and interpreted
- Javascript is designed to be light weight and is interpreted by browser making it quick to execute.

6. Cross platform suppor :
Javascript runs on any platform that has a web browser.

7. Rich Ecosystem
- A large ecosystem of libraries and frameworks (such as Angular JS node JS.

* program :-

```
<html>
 <head>
        <title> welcome Message </title>
 </head>
 <body>   <h1 id="welcome-message"></h1>
      <script>

            document.getElement By Id
            ("welcome-message");
      </script>
 </bod>
</html>
```

* compare React JS and Angular JS and Vue JS.

React JS	Agular JS	Vue JS
1 React JS is Javascript library for creating user Interface	1. Agular JS is a Typescript based framework for building web page	1 Vue JS is a progressive Java script framework used for creating user
2. Devloped by facebook	2. Developed by google	2. Developed by Evan you.
3 language support Javascript, JSX	3 language support Typescript, HTML CSS	3. language support Javascript, HTML CSS.
4. Data Binding is one way	4. Data Binding is two way	4. Data Binding is two way.
5. It has large active community	5. It has large, Backed by Google community	5. Growing Strong comunity.
6 It has React Router	6. It has Built in Angular Router.	6. It has Vue Router.
7. It has small libraries	7. It has large framework	7. It has Small to meadium (framework/ library)
8. It has high performance due to virtual DOM	8. It has High performance due to advanced optimization	8. High performance due to small size & ~~VDM~~ virtual DOM.