



Faculty of Engineering & Technology
Department of CSE
Assignment

Course name: Design Pattern and Java Programming
Course Code: CSE 2103

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Session: 2018-19
2nd Year 1st Semester
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Date of submission: 27 / 07 / 2021

Ans. to the Q No. ①

GUI

⇒ GUI stands for Graphical User Interface. GUI is a user-friendly interface used to communicate with the help of electronic devices. It displays all the contents whether a text file or an object or pictures or videos and all the things that a user want to visualize. It interacts well and can be used everywhere whether a mobile phone, tablet, laptops, Personal Computer and all the other electronic devices. It can be used best in the gaming side where the resolution is being considered.

Swing

⇒ Swing is the collection of user interface components for Java programs. It is part of Java Foundation classes that are referred to as JFC. In simple words, Swing is the graphical user interface toolkit that is used for developing windows based java applications or programs. It is the successor of AWT, which is known as Abstract window toolkit API for Java, and AWT components are mainly heavyweight.

Features of Swing

⇒ The features of the Swing are as follows :

1. Platform Independent :

It is platform-independent; the swing components that are used to build the program are not platform-specific. It can be used on any platform and anywhere.

2. Lightweight :

Swing components are lightweight, which helps in creating the UI lighter.

3. Plugging :

It has a powerful component that can be extended to provide support for the user interface that helps in a good look and feel to the application. Its components are imported through a package called `java.swing`.

4. Manageable :

It is easy to manage and configure. Its mechanism and composition pattern allows changing the settings at run time as well.

5. MVC :

They mainly follow the concept of MVC that is the Model View Controller. With the help of this, we can do the changes in one components without impacting or touching other components. It is known as loosely coupled architecture as well.

6. Customizable :

Swing controls can be easily customized. It can be changed, and the visual appearance of the swing component application independent of its internal representation.

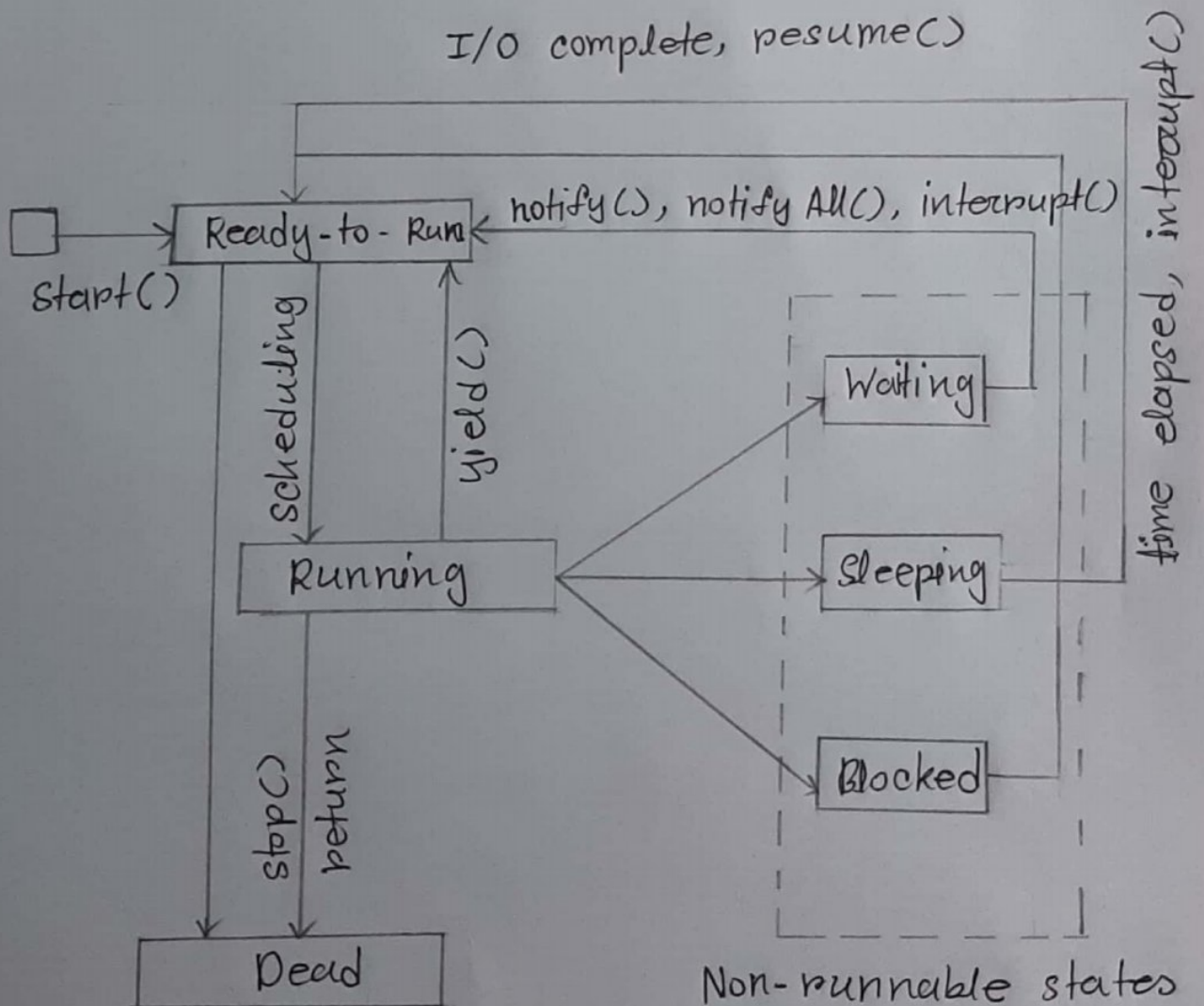
Ans. to the Q. No. ②

Threading :

⇒ Threads allows a program to operate more efficiently by doing multiple things at the same time.

Threads can be used to perform complicated tasks in the background without interrupting the main program.

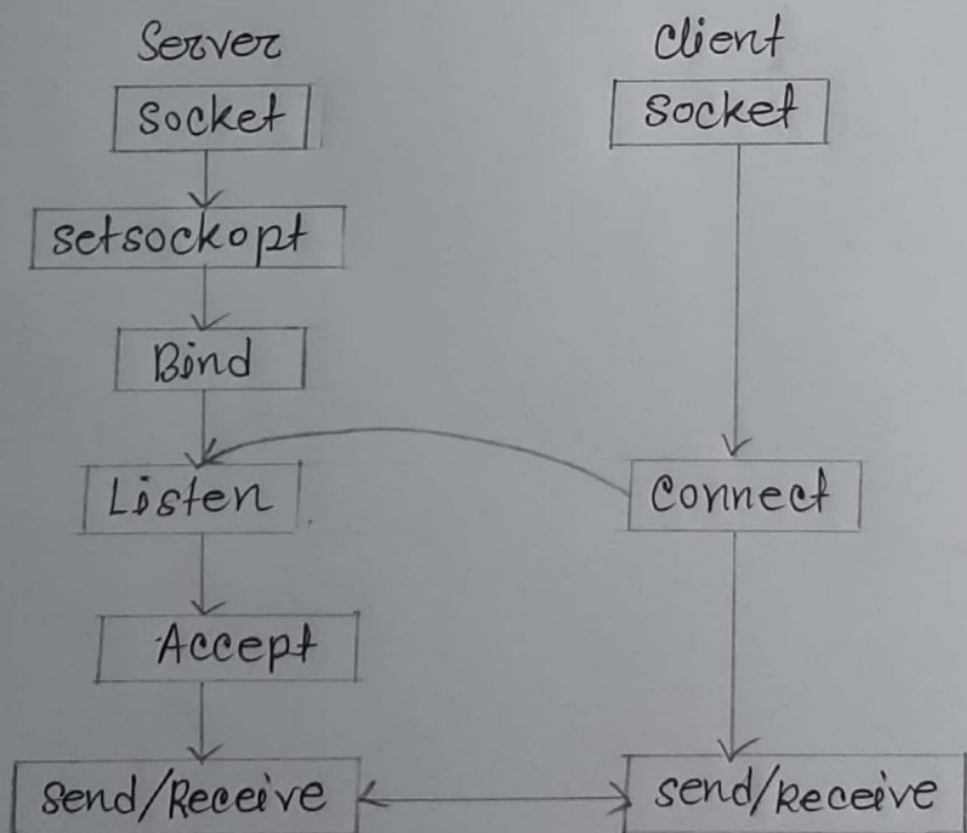
Life-cycle of a thread in java -



Socket Programming :

⇒ Socket programming is a way of connecting two nodes on a network to communicate with each other. One socket listens on a particular port at an IP, while other socket reaches out to the other to form a connection. Server forms the listener socket while client reaches out to the server.

→ State diagram for server and client model -



A java program showing a single client - single server
java socket program -

```
package server;  
  
import java.net.*;  
import java.io.*;  
  
class MyServer {  
    public static void main(String args[]) throws Exception {  
        ServerSocket ss = new ServerSocket(3333);  
        Socket s = ss.accept();  
        DataInputStream din = new DataInputStream(s.getInputStream());  
        DataOutputStream dout = new DataOutputStream(s.getOutputStream());  
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));  
  
        String str = "", str2 = "";  
        while (!str.equals("stop")) {  
            str = din.readUTF();  
            System.out.println("client says: " + str);  
            str2 = br.readLine();  
            dout.writeUTF(str2);  
            dout.flush();  
        }  
    }  
}
```



```

package client;
import java.net.*;
import java.io.*;

class MyClient {
    public static void main(String args[]) throws Exception {
        Socket s = new Socket("localhost", 3333);
        DataInputStream din = new DataInputStream(s.getInputStream());
        DataOutputStream dout = new DataOutputStream(s.getOutputStream());
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
        String str = "", str2 = "";
        while (!str.equals("stop")) {
            str = br.readLine();
            dout.writeUTF(str);
            dout.flush();
            str2 = din.readUTF();
            System.out.println("server says: " + str2);
        }
    }
}

```