



JAVA slips 1-15 - Java Practical

Bsc (computer science) (Savitribai Phule Pune University)



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Slip No 1

Q1. Write a Java program to display all the alphabets between 'A' to 'Z' after every 2 seconds

```
Public class Slip26_1 extends Thread
{
char c;
public void run()
{
for(c = 'A'; c<='Z';c++)
{
System.out.println(""+c);
try

{
Thread.sleep(3000);
}
catch(Exception e)
{
e.printStackTrace();
}
}
}

public static void main(String args[])
{
Slip26_1 t = new Slip26_1();
t.start();
}
```

2. Write a Java program to accept the details of Employee (Eno, EName, Designation, Salary) from a user and store it into the database. (Use Swing)

```
import java.awt.*;
import javax.swing.*;
import java.awt.event.*;
import java.sql.*;

public class Ass1 extends Frame implements ActionListener
{
    Label l1,l2,l3;
    TextField t1,t2,t3;
    Button b;
    Connection cn;
    Statement st;
    ResultSet rs;
    public Ass1()
    {
        setLayout(null);
        l1=new Label("Eno");
        l2=new Label("EName");
        l3=new Label("Salary");
        t1=new TextField();
        t2=new TextField();
        t3=new TextField();
        b=new Button("Save");
        l1.setBounds(50,50,100,30);
        t1.setBounds(160,50,100,30);
        l2.setBounds(50,90,100,30);
        t2.setBounds(160,90,100,30);
```

```

l3.setBounds(50,130,100,30);
t3.setBounds(160,130,100,30);
b.setBounds(50,170,100,30);
add(l1);
add(t1);
add(l2);
add(t2);
add(l3);
add(t3);
add(b);
b.addActionListener(this);
setSize(500,500);
setVisible(true);
addWindowListener(new WindowAdapter()
{
    public void windowClosing(WindowEvent e)
    {
        System.exit(0);
    }
});
}
public void actionPerformed(ActionEvent oe)
{
    String str=oe.getActionCommand();
    if(str.equals("Save"))
    {
        try
        {
            Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");
            cn=DriverManager.getConnection("jdbc:odbc:Ass","","");
            st =cn.createStatement();
            int en=Integer.parseInt(t1.getText());

```

```

String enn=t2.getText();
int sal=Integer.parseInt(t3.getText());
String strr="insert into emp values(" + en + " ,'" + enn + "','" + sal
+ ")";
int k=st.executeUpdate(strr);
if(k>0)
{

JOptionPane.showMessageDialog(null,"Record Is Added");
}
}
catch(Exception er)
{
System.out.println("Error");
}
}
}
public static void main(String args[])
{
new Ass1().show();
}
}

```

Slip Nos - 2

1. Write a java program to read 'N' names of your friends, store it into HashSet and display them in ascending order

```
// Java program to sort a HashSet

import java.util.*;

public class GFG {
    public static void main(String args[])
    {
        // Creating a HashSet
        HashSet<String> set = new HashSet<String>();

        // Adding elements into HashSet using add()
        set.add("geeks");
        set.add("practice");
        set.add("contribute");
        set.add("ide");

        System.out.println("Original HashSet: "
                           + set);

        // Sorting HashSet using List
        List<String> list = new ArrayList<String>(set);
        Collections.sort(list);

        // Print the sorted elements of the HashSet
        System.out.println("HashSet elements "
                           + "in sorted order "
                           + "using List: "
                           + list);
    }
}
```

2. Design a servlet that provides information about a HTTP request from a client, such as IP-Address and browser type. The servlet also provides information about the server on which the servlet is running, such as the operating system type, and the names of currently loaded servlets.

```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class NewServlet extends HttpServlet
{

    public void doGet(HttpServletRequest req,HttpServletResponse
resp)throws IOException,ServletException
    {
        resp.setContentType("text/html");
        String userinfo=req.getHeader("User-Agent");

        PrintWriter p=resp.getWriter();
    }
}
```

```
<html>
  <body>
    <form action="http://localhost:8080/serv/NewServlet"
method="get">
      Username:<input type="text" name="t1">
        <input type="submit" >
    </form>
  </body>
</html>
```

Slip Nos 3

1. Write a JSP program to display the details of Patient (PNo, PName, Address, age, disease) in tabular form on browser.

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<body>
<%@ page import="java.sql.*;" %>
<%! inthno;
String hname,address; %>
<%
try{
Class.forName("sun.jdbc.odbc.JdbcOdbcDriver");

Connection
cn=DriverManager.getConnection("jdbc:odbc:hospital_da
ta","","");
Statement st=cn.createStatement();
ResultSetrs=st.executeQuery("select * from Hospital");
%>
<table border="1" width="40%"> <tr> <td>Hospital
No</td> <td>Name</td> <td>Address</td> </tr> <%
while(rs.next()) { %> <tr><td><%=
rs.getInt("hno") %></td> <td><%=
rs.getString("hname") %></td> <td><%=
rs.getString("address") %> </tr> <%
}
cn.close();
}catch(Exception e)
{
out.println(e);
}
%>
</body>
</html>
```


2. Write a Java program to create LinkedList of String objects and perform the following: i. Add element at the end of the list ii. Delete first element of the list iii. Display the contents of list in reverse order

```
import java.io.*;

// Java program to implement
// a Singly Linked List
public class LinkedList {

    Node head; // head of list

    // Linked list Node.
    // Node is a static nested class
    // so main() can access it
    static class Node {

        int data;
        Node next;

        // Constructor
        Node(int d)
        {
            data = d;
            next = null;
        }
    }

    // Method to insert a new node
```

```

public static LinkedList insert(LinkedList list,
                                int data)
{
    // Create a new node with given data
    Node new_node = new Node(data);
    new_node.next = null;

    // If the Linked List is empty,
    // then make the new node as head
    if (list.head == null) {
        list.head = new_node;
    }
    else {
        // Else traverse till the last node
        // and insert the new_node there
        Node last = list.head;
        while (last.next != null) {
            last = last.next;
        }

        // Insert the new_node at last node
        last.next = new_node;
    }

    // Return the list by head
    return list;
}

// Method to print the LinkedList.
public static void printList(LinkedList list)
{
    Node currNode = list.head;

```

```

        System.out.print("LinkedList: ");

        // Traverse through the LinkedList
        while (currNode != null) {
            // Print the data at current node
            System.out.print(currNode.data + " ");

            // Go to next node
            currNode = currNode.next;
        }

        System.out.println();
    }

    // *****DELETION BY KEY*****

    // Method to delete a node in the LinkedList by
    KEY
    public static LinkedList deleteByKey(LinkedList
    list,
                                     int
    key)
    {
        // Store head node
        Node currNode = list.head, prev = null;

        //
        // CASE 1:
        // If head node itself holds the key to be
    deleted

        if (currNode != null && currNode.data ==
    key) {

```

```

        list.head = currNode.next; // Changed
head

        // Display the message
        System.out.println(key + " found and
deleted");

        // Return the updated List
        return list;
    }

    //
    // CASE 2:
    // If the key is somewhere other than at
head
    //

    // Search for the key to be deleted,
    // keep track of the previous node
    // as it is needed to change currNode.next
    while (currNode != null &&
currNode.data != key) {
        // If currNode does not hold key
        // continue to next node
        prev = currNode;
        currNode = currNode.next;
    }

    // If the key was present, it should be at
currNode
    // Therefore the currNode shall not be
null
    if (currNode != null) {

```

```

        // Since the key is at currNode
        // Unlink currNode from linked list
        prev.next = currNode.next;

        // Display the message
        System.out.println(key + " found and
deleted");
    }

    //
    // CASE 3: The key is not present
    //

    // If key was not present in linked list
    // currNode should be null
    if (currNode == null) {
        // Display the message
        System.out.println(key + " not found");
    }

    // return the List
    return list;
}

// *****MAIN METHOD*****

// method to create a Singly linked list with n
nodes
public static void main(String[] args)
{
    /* Start with the empty list. */
    LinkedList list = new LinkedList();

```

```

//
// *****INSERTION*****
//

// Insert the values
list = insert(list, 1);
list = insert(list, 2);
list = insert(list, 3);
list = insert(list, 4);
list = insert(list, 5);
list = insert(list, 6);
list = insert(list, 7);
list = insert(list, 8);

// Print the LinkedList
printList(list);

//
// *****DELETION BY KEY*****
//

// Delete node with value 1
// In this case the key is ***at head***
deleteByKey(list, 1);

// Print the LinkedList
printList(list);

// Delete node with value 4
// In this case the key is present ***in
the
// middle***
deleteByKey(list, 4);

```

```
        // Print the LinkedList
        printList(list);

        // Delete node with value 10
        // In this case the key is ***not
present***
        deleteByKey(list, 10);

        // Print the LinkedList
        printList(list);
    }
}
```

Slip Nos - 4

Q1) Write a Java program using Runnable interface to blink Text on the frame

```
import java.awt.*;
import java.awt.event.*;

class Slip8_1 extends Frame implements Runnable
{
    Thread t;
    Label l1;
    int f;
    Slip8_1()
    {
        t=new Thread(this);
        t.start();
        setLayout(null);
        l1=new Label("Hello JAVA");
        l1.setBounds(100,100,100,40);
        add(l1);
        setSize(300,300);
        setVisible(true);
        f=0;
    }
    public void run()
    {
        try
        {
            if(f==0)
            {
                t.sleep(200);
                l1.setText("");
                f=1;
            }
            if(f==1)
            {
                t.sleep(200);
                l1.setText("Hello Java");
                f=0;
            }
        }
        catch(Exception e)
        {
            System.out.println(e);
        }
        run();
    }
}
```



```

        public static void main(String a[])
        {
            new Slip8_1();
        }
    }

```

Q2) Write a Java program to store city names and their STD codes using an appropriate collection and perform following operations: i. Add a new city and its code (No duplicates) ii. Remove a city from the collection iii. Search for a city name and display the code

```

import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
import java.util.*;

class Slip16_2 extends JFrame implements ActionListener
{
    JTextField t1,t2,t3;
    JButton b1,b2,b3;
    JTextArea t;
    JPanel p1,p2;

    Hashtable ts;
    Slip16_2()
    {
        ts=new Hashtable();
        t1=new JTextField(10);
        t2=new JTextField(10);
        t3=new JTextField(10);

        b1=new JButton("Add");
        b2=new JButton("Search");
        b3=new JButton("Remove");

        t=new JTextArea(20,20);
        p1=new JPanel();
        p1.add(t);

        p2= new JPanel();
    }
}

```

```

        p2.setLayout(new GridLayout(2,3));
        p2.add(t1);
        p2.add(t2);
        p2.add(b1);
        p2.add(t3);
        p2.add(b2);
        p2.add(b3);

        add(p1);
        add(p2);

        b1.addActionListener(this);
        b2.addActionListener(this);
        b3.addActionListener(this);

        setLayout(new FlowLayout());
        setSize(500,500);
        setVisible(true);
        setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
    public void actionPerformed(ActionEvent e)
    {
        if(b1==e.getSource())
        {
            String name = t1.getText();
            int code = Integer.parseInt(t2.getText());
            ts.put(name,code);
            Enumeration k=ts.keys();
            Enumeration v=ts.elements();
            String msg="";
            while(k.hasMoreElements())
            {
                msg=msg+k.nextElement()+" = "+v.nextElement()+"\n";
            }
            t.setText(msg);
            t1.setText("");
            t2.setText("");
        }
        else if(b2==e.getSource())
        {
            String name = t3.getText();

            if(ts.containsKey(name))
            {
                t.setText(ts.get(name).toString());
            }

            else
                JOptionPane.showMessageDialog(null,"City not
found ...");
        }
        else if(b3==e.getSource())
    }

```

```

        {
            String name = t3.getText();

            if(ts.containsKey(name))
            {
                ts.remove(name);
                JOptionPane.showMessageDialog(null,"City
Deleted ...");
            }

            else
                JOptionPane.showMessageDialog(null,"City not
found ...");
        }
    }
    public static void main(String a[])
    {
        new Slip16_2();
    }
}

```

Slip Nos-5

1) Write a Java Program to create the hash table that will maintain the mobile number and student name. Display the details of student using Enumeration interface

```
// Java Program to Demonstrate Getting Keys
// as an Enumeration of Hashtable class

// Importing required classes
import java.io.*;
import java.util.*;

// Main class
class GFG {

    // Main driver method
    public static void main(String[] args)
    {
        // Creating an empty hashtable
        Hashtable<String, String> ht
            = new Hashtable<String, String>();

        // Inserting key-value pairs into hash
table
        // using put() method
        ht.put("Name", "Rohan");
        ht.put("Mpbile_Nos", "8446049402");

        // Now creating an Enumeration object
```

```

// to store keys
Enumeration<String> e = ht.keys();

// Condition holds true till there is
// single key remaining
while (e.hasMoreElements()) {

    // Getting key
    String key = e.nextElement();

    // Printing key and value
corresponding to
    // that key
    System.out.println(key + ":" +
ht.get(key));
}
}
}

```

Q2) Create a JSP page for an online multiple choice test. The questions are randomly selected from a database and displayed on the screen. The choices are displayed using radio buttons. When the user clicks on next, the next question is displayed. When the user clicks on submit, display the total score on the screen

Exam. jsp

```
<%@page import="java.sql.*,java.util.*"%>
<%
    Class.forName("org.postgresql.Driver");

    Connection con = DriverManager.getConnection(
        "jdbc:postgresql:ty1","postgres","");

    Set s = new TreeSet();

    while(true){
        int n = (int)(Math.random()*11+1);

        s.add(n);

        if(s.size()==5) break;
    }

    PreparedStatement ps = con.prepareStatement("select * from
questions where qid=?");
%>
<form method='post' action='accept_ans.jsp'>
<table width='70%' align='center'>
<%
    int i=0;
    Vector v = new Vector(s);
    session.setAttribute("qids",v);

    int qid = Integer.parseInt(v.get(i).toString());
    ps.setInt(1,qid);
    ResultSet rs = ps.executeQuery();
    rs.next();
%>
<tr>
    <td><b>Question:<%=i+1%></b></td>
</tr>
<tr>
    <td><pre><b><%=rs.getString(2)%></pre></b></td>
</tr>
<tr>
    <td>
```

```

        <b>
        <input type='radio' name='op' value=1><%=rs.getString(3)%><br>
        <input type='radio' name='op' value=2><%=rs.getString(4)%><br>
        <input type='radio' name='op' value=3><%=rs.getString(5)%><br>
        <input type='radio' name='op' value=4><%=rs.getString(6)%><br><br>
        </b>
        </td>
    </tr>
    <tr>
        <td align='center'>
            <input type='submit' value='Next' name='ok'>
            <input type='submit' value='Submit' name='ok'>
        </td>
    </tr>
</table>
<input type='hidden' name='qno' value=<%=qid%>>
<input type='hidden' name='qid' value=<%=i+1%>>
</form>
</body>

```

Acceptans.jsp

```

<%@page import="java.sql.*,java.util.*"%>
<%
    Class.forName("org.postgresql.Driver");

    Connection con = DriverManager.getConnection(
        "jdbc:postgresql:ty1","postgres","");

    Vector answers = (Vector)session.getAttribute("answers");

    if(answers==null)
        answers = new Vector();

    int qno = Integer.parseInt(request.getParameter("qno"));
    int ans = Integer.parseInt(request.getParameter("op"));
    int i = Integer.parseInt(request.getParameter("qid"));

    answers.add(qno+" "+ans);

    session.setAttribute("answers",answers);

    String ok = request.getParameter("ok");

    if(ok.equals("Submit") || i==5){
        response.sendRedirect("result.jsp");
        return;
    }

    PreparedStatement ps = con.prepareStatement("select * from
questions where qid=?");
%>

```

```

<form method='post' action='accept_ans.jsp'>
<table width='70%' align='center'>
<%
    Vector v = (Vector)session.getAttribute("qids");

    int qid = Integer.parseInt(v.get(i).toString());
    ps.setInt(1,qid);
    ResultSet rs = ps.executeQuery();
    rs.next();
%>
<tr>
<td><b>Question:<%=i+1%></b></td>
</tr>
<tr>
<td><pre><b><%=rs.getString(2)%></pre></b></td>
</tr>
<tr>
<td>
<b>
<input type='radio' name='op' value=1><%=rs.getString(3)%><br>
<input type='radio' name='op' value=2><%=rs.getString(4)%><br>
<input type='radio' name='op' value=3><%=rs.getString(5)%><br>
<input type='radio' name='op' value=4><%=rs.getString(6)%><br><br>
</b>
</td>
</tr>
<tr>
<td align='center'>
<input type='submit' value='Next' name='ok'>
<input type='submit' value='Submit' name='ok'>
</td>
</tr>
</table>
<input type='hidden' name='qno' value=<%=qid%>>
<input type='hidden' name='qid' value=<%=i+1%>>
</form>
</body>

```

Result. jsp

```

<%@page import="java.sql.*,java.util.*,java.text.*"%>
<%
    Class.forName("org.postgresql.Driver");

    Connection con = DriverManager.getConnection(
        "jdbc:postgresql:ty1","postgres","");

    Vector v = (Vector)session.getAttribute("answers");
    if(v==null){
%>
<h1>No questions answered</h1>
<%
        return;
    }

```



```
PreparedStatement ps = con.prepareStatement("select ans from
questions where qid=?");
```

```
int tot=0;
```

```
for(int i=0;i<v.size();i++){
    String str = v.get(i).toString();
    int j = str.indexOf(' ');
    int qno = Integer.parseInt(str.substring(0,j));
    int gans = Integer.parseInt(str.substring(j+1));
```

```
ps.setInt(1,qno);
```

```
ResultSet rs = ps.executeQuery();
rs.next();
```

```
int cans = rs.getInt(1);
```

```
if(gans==cans) tot++;
```

```
}
```

```
session.removeAttribute("qids");
session.removeAttribute("answers");
session.removeAttribute("qid");
```

```
%>
```

```
<h3>Score:<%=tot%></h3>
```

```
<center><a href='exam.jsp'>Restart</a></center>
```

```
</body>
```

SQL File

```
create table questions(qid serial primary key, question text, option1
text, option2 text, option3 text, option4 text, ans int);
```

```
insert into questions
```

```
(question,option1,option2,option3,option4,ans)
```

```
values
```

```
('Who is prime minister of India?','Rahul Gandhi','Narendra
Modi','Sonia Gandhi','Manmohan Singh',2),
```

```
('Who is finance minister of India','Rahul Gandhi','P
Chidambaram','Manmohan Singh','Arun Jatuly',4),
```

```
('What is square root of 16?','2','4','1','256',4),
```

```
('Who is chief minister of Maharashtra','Uddhav Tharakey','Devendra
Fadanavis','Raj Thakarey','Sharad Pawar',2),
```

```
('What is full form of LIFO?','Last In First Out','Late In First
Out','Long In First Out','Large In First Out',1),
```

```
('Which is capital of India','Delhi','Maharashtra','Kolkata','Goa',1),
```

```
('What is currency of India','Dollar','Rupee','Pound','Yen',2),
```

```
('Who Invented C?','Kim Thompson','Bill Joy','Dennis Ritchie','Balaguru
Swamy',3),
```

```
('Where was Java invented?','Microsoft','Oracle','Sun
Microsystem','Intel',3),
```

```
('What is cube root of 8?','2','3','4','5',1),('What is full form of
FIFO','Fast In First Out','First in First Out','Fast In First
Out','First In First Out',2);
```

Slip Nos-6

Q1) Write a Java program to accept 'n' integers from the user and store them in a collection. Display them in the sorted order. The collection should not accept duplicate elements. (Use a suitable collection). Search for a particular element using predefined search method in the Collection framework.

```
import java.util.*;
import java.io.*;

class Slip19_2
{
    public static void main(String[] args) throws Exception
    {
        int no,element,i;
        BufferedReader br=new BufferedReader(new
        InputStreamReader(System.in));
        TreeSet ts=new TreeSet();
        System.out.println("Enter the of elements :");
        no=Integer.parseInt(br.readLine());
        for(i=0;i<no;i++)
        {
            System.out.println("Enter the element : ");
            element=Integer.parseInt(br.readLine());
            ts.add(element);
        }

        System.out.println("The elements in sorted order :"+ts);
        System.out.println("Enter element to be serach : ");
        element = Integer.parseInt(br.readLine());
        if(ts.contains(element))
            System.out.println("Element is found");
        else
            System.out.println("Element is NOT found");
    }
}
```

Q2) Write a java program to simulate traffic signal using threads

```
import java.applet.*;
import java.awt.*;
class Slip3_2 extends Applet implements Runnable
{
    Thread t;
    int r,g1,y,i;
    public void init()
    {
        T=new Thread(this);
        t.start();
        r=0; g1=0;I=0; y=0;
    }
    public void run()
    {
        try
        {
            for(I =24; I >=1;i--)
            {
                if (I >16&& I <=24)
                {
                    t.sleep(200);
                    r=1;
                    repaint();
                }
                if (I >8&& I <=16)
                {
                    t.sleep(200);
                    y=1;
                    repaint();
                }
                if(I >1&& I <=8)
                {
                    t.sleep(200);
                    g1=1;
                    repaint();
                }
            }
            if (I ==0)
            {
                run();
            }
        }
    }
}
```

```

    }
    }
    catch(Exception e)
    { System.out.println(e);
    }
    } public void paint(Graphics g)
    {
    g.drawRect(100,100,100,300);
    if (r==1)
    {
    g.setColor(Color.red);
    g.fillOval(100,100,100,100);

    g.setColor(Color.black);
    g.drawOval(100,200,100,100);
    g.drawOval(100,300,100,100);
    r=0;
    }
    if (y==1)
    {
    g.setColor(Color.black);
    g.drawOval(100,100,100,100);
    g.drawOval(100,300,100,100);
    g.setColor(Color.yellow);
    g.fillOval(100,200,100,100);
    y=0;
    }
    if (g1==1)
    {
    g.setColor(Color.black);
    g.drawOval(100,100,100,100);
    g.drawOval(100,200,100,100);
    g.setColor(Color.green);
    g.fillOval(100,300,100,100);
    g1=0;
    }
    }
    }
    }

```

Slip Nos-7

Q1. Write a java program that implements a multi-thread application that has three threads. First thread generates random integer number after every one second, if the number is even; second thread computes the square of that number and print it. If the number is odd, the third thread computes the of cube of that number and print it.

```
import java.util.Random;

class Square extends Thread
{
    int x;

    Square(int n)
    {
        x = n;
    }

    public void run()
    {
        int sqr = x * x;

        System.out.println("Square of " + x + " = " + sqr );
    }
}
```

```

class Cube extends Thread
{
    int x;

    Cube(int n)
    {x = n;
    }

    public void run()
    {
        int cub = x * x * x;

        System.out.println("Cube of " + x + " = "
+ cub );
    }
}

class Number extends Thread
{
    public void run()
    {
        Random random = new Random();

        for(int i =0; i<5; i++)
        {

            int randomInteger = random.nextInt(100);

            System.out.println("Random Integer
generated : " + randomInteger);

            Square s = new Square(randomInteger);

            s.start();

```

```
Cube c = new Cube(randomInteger);
c.start();
try {
    Thread.sleep(1000);
} catch (InterruptedException ex) {
    System.out.println(ex);
}
}
}
}

public class Thr {
    public static void main(String args[])
    {
        Number n = new Number();
        n.start();
    }
}
```

Q2. Write a java program for the following: i. To create a Product(Pid, Pname, Price) table. ii. Insert at least five records into the table. iii. Display all the records from a table.

```
// Java program to illustrate
// inserting to the Database
import java.sql.*;

public class insert1
{
    public static void main(String args[])
    {
        String id = "id1";
        String pwd = "pwd1";
        String fullname = "geeks for geeks";
        String email = "geeks@geeks.org";

        try
        {
            Class.forName("oracle.jdbc.driver.OracleDriver");
            Connection con = DriverManager.getConnection("
jdbc:oracle:thin:@localhost:1521:orcl", "login1",
"pwd1");

            Statement stmt = con.createStatement();
```



```

        // Inserting data in database
        String q1 = "insert into userid values(' " +id+ "',
' " +pwd+
        "", ' " +fullname+ "',
' " +email+ "')";

        int x = stmt.executeUpdate(q1);
        if (x > 0)

            System.out.println("Successfully Inserted");

        else

            System.out.println("Insert Failed");


        con.close();
    }
    catch(Exception e)
    {

        System.out.println(e);
    }
}
}

```

SLip Nops-8

1) Write a java program to define a thread for printing text on output screen for 'n' number of times. Create 3 threads and run them. Pass the text 'n' parameters to the thread constructor. Example: i. First thread prints "COVID19" 10 times. ii. Second thread prints "LOCKDOWN2020" 20 times iii. Third thread prints "VACCINATED2021" 30 times



```
public class A1 extends Thread {  
    String str;  
    int n;  
  
    A1(String str, int n) {  
        this.str = str;  
        this.n = n;  
    }  
  
    public void run() {  
        try {  
            for (int i = 0; i < n; i++) {  
                System.out.println(getName()  
+ " : " + str);  
            }  
        }  
    }  
}
```

```
        }  
    } catch (Exception e) {  
        e.printStackTrace();  
    }  
}  
  
public static void main(String[] args)  
{  
  
    A1 t1 = new A1("COVID19", 10);  
    A1 t2 = new A1("LOCKDOWN2020", 20);  
    A1 t3 = new A1("VACCINATED", 30);  
  
    t1.start();  
    t2.start();  
    t3.start();  
  
}  
}
```

2. Write a JSP program to check whether a given number is prime or not. Display the result in red color.

```
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-
8">
    <title>JSP Page</title>
  </head>
  <body><center><h1>The required Result is:: </h1>
    <h2>
      <%
        int n,i,flag=0;

        String ns= request.getParameter("n");
        n=Integer.parseInt(ns);
        if(n>1)
        {

          for(i=2;i<=n/2;i++)
          {
            if(n%i==0)
            {
              flag=1;
              break;
            }
          }
        }
        if(flag==0)
        {
          out.println("<pre>");
          out.println(n+" is a prime no.");
          out.println("</pre>");
        }
        else
        {
          out.println("<pre>");
          out.println(n+" is not a prime no.");
        }
      %>
    </h2>
  </body>
</html>
```

```
        out.println("</pre>");
    }

    %>

    </h2></center>
</body>
</html>
```

Slip no - 9

1. Write a Java program to create a thread for moving a ball inside a panel vertically. The ball should be created when the user clicks on the start button

```
import java.awt.*;import java.awt.geom.*;import javax.swing.*;import
java.awt.event.*;import java.util.*;
public class BouncingBallApp extends JFrame
{
    //start of main method
    public static void main(String[] args)
    {
        //crate container
        Container container = new Container();
        //crate BouncingBallApp instance
        BouncingBallApp bBalls = new BouncingBallApp();
        //set the window closing feature(close with X click)
        bBalls.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        //crate boucing ball panel(BBP) instance and add
        BouncingBallPanel BBP = new BouncingBallPanel();
        container.add(BBP);
        //make the BBP the MouseListner
        bBalls.addMouseListener(BBP);
        //set window background and size
        bBalls.setBackground(Color.WHITE);
        bBalls.setSize(400, 300);
        BBP.setSize(400, 300);
        BBP.setLayout(null);
        bBalls.setContentPane(BBP);
        //set window visible
        bBalls.setVisible(true);
    }//end of main method
}//end of Class BouncingBall App
```

class BouncingBallPanel extends JPanel implements MouseListener

```
{
    //create an empty array for 20 Ball objects
    public Ball[] array;
    private int count = 0;
    Random generator = new Random();

    public BouncingBallPanel()
    {
        array = new Ball[20];
    }

    public void mouseClicked(MouseEvent event)
    {
        array[count] = new Ball(this);
        count++;
        if( count == 1)
        {
            final Runnable update = new Runnable()
            {
                public void run()
                {
                    for (int j = 0; j < array.length; j++)
                    {
                        if(array[j] != null)
                        {
                            array[j].move();
                        }
                    }
                }
            };
            (new Thread(update)).start();
            Runnable graphic = new Runnable()
            {
                public void run()
                {
                    while(true)
                    {
```

```

        try
        {
            EventQueue.invokeLater(update);
            Thread.sleep(generator.nextInt(10 + 100));
        } catch (InterruptedException exp){}
    } //end of while
} //end of run
}; //end of runnable
new Thread(graphic).start();
} //end of if
} //end of mouseClicked method

//empty interfaces for mouse events
public void mouseExited(MouseEvent event){}
public void mouseReleased(MouseEvent event){}
public void mouseEntered(MouseEvent event){}
public void mousePressed(MouseEvent event){}

//paint component method
public void paintComponent(Graphics g)
{
    super.paintComponent(g);
    Graphics2D g2d = (Graphics2D) g;
    //loop for each ball and draw all balls in array
    for(int i = 0; i < array.length; i++)
    {
        if(array[i] != null)
        {
            g2d.setColor(array[i].getColor());
            g2d.fillOval((int)array[i].getX(), (int)array[i].getY(),
(int)array[i].getDiameter(), (int)array[i].getDiameter());
        }
    }
} //end of for loop
} //end of paintComponent loop
} //end of Class BouncingBallPanel
class Ball implements Runnable
{
    //set up variables
    private double x;

```



```

private double y;
private int deltaX;
private int deltaY;
private double diameter;
private Color color;
BouncingBallPanel BBP2;

Random random = new Random();

public Ball(BouncingBallPanel a)
{
    x = random.nextInt(400);
    y = random.nextInt(300);
    deltaX = 1 + random.nextInt(10);
    deltaY = 1 + random.nextInt(10);
    diameter = 5 + random.nextInt(20);
    color = new Color(random.nextInt(256), random.nextInt(256),
random.nextInt(256));
    BBP2 = a;
} // end of constructor

public double getX()
{
    return x;
}

public double getY() {
    return y;
}

public double getDiameter() {
    return diameter;
}

public Color getColor() {
    return color;
}

public void move() {

```

```

x += deltaX;
y += deltaY;

if (x > 400 - getDiameter() || x < 0)
{
    deltaX = -deltaX;
}

if (y > 300 - getDiameter() || y < 0)
{
    deltaY = -deltaY;
}

} // end of method move
@Override
public void run()
{
    while(true)
    {
        move();
        BBP2.repaint();
        try{
            Thread.currentThread().sleep(10 + random.nextInt(100));
        }catch(InterruptedException exp){}
    } //end of while
} //end of run method
} //end of Ball

```

2. Write a Java program using Spring to display the message “If you can’t explain it simply, you don’t understand it well enough” .

!!!!!!! ISKA KYA HAI NAH PATA MUJHE BHI

Slip Nos -10

Q1) Write a Java program to display the Current Date using spring

```
// Java Program to Display Current Date and Time

import java.text.*;
import java.util.*;

public class GFG {

    public static void main(String args[])

    {

        SimpleDateFormat formatDate = new
SimpleDateFormat(

            "dd/MM/yyyy HH:mm:ss z");

        // "SimpleDateFormat" class
        initialize with object

        // "formatDate" this class acceptes
        the format of

        // date and time as "dd/MM/yyyy"
        and "HH:mm:ss z"

        // "z" use for print the time zone

        Date date = new Date();
```

```
        // initialize "Date" class

        formatDate.setTimeZone(TimeZone.getTime
Zone("IST"));

        // converting to IST or format the
Date as IST

        System.out.println(formatDate.format(da
te));

        // print formatted date and time
    }
}
```

Q2)

Write a Java program to display first record from student table (RNo, SName, Per) onto the TextFields by clicking on button. (Assume Student table is already created).

```
$ sudo -u postgres psql
[sudo] password for codeforever:
psql (9.3.11)
Type "help" for help.
```

```
postgres=# create database stud;
CREATE DATABASE
```

```
postgres=# \c stud
You are now connected to database "stud" as user "postgres".
```

```
stud=# create table student(rollno int primary key,name text,percentage
float);
CREATE TABLE
*/
```

```
package studdb;
import javax.swing.table.*;
import java.sql.*;
import java.awt.event.*;
import java.awt.*;
import javax.swing.*;
public class StudDb extends JFrame implements ActionListener
{
    JTextField t1,t2,t3;
    JLabel l1,l2,l3;
    JButton b1,b2;
    int row,column;
    StudDb()
    {
        setLayout(new FlowLayout());
        setSize(500,500);
    }
}
```

```

setVisible(true);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

l1=new JLabel("RollNo");
add(l1);

t1=new JTextField(10);
add(t1);

l2=new JLabel("Name");
add(l2);

t2=new JTextField(10);
add(t2);

l3=new JLabel("Percentage");
add(l3);

t3=new JTextField(10);
add(t3);

b1=new JButton("Insert");
add(b1);
b1.addActionListener(this);

b2=new JButton("Display");
add(b2);
b2.addActionListener(this);

try
{
    Class.forName("org.postgresql.Driver");
}
catch(Exception e)
{
    System.out.println("Error"+e.getMessage());
}
}
public void actionPerformed(ActionEvent e2)
{
    if(e2.getSource()==b1)
    {
        try
        {
            int eno=Integer.parseInt(t1.getText());
            String ename=t2.getText();
            float percentage=Float.parseFloat(t3.getText());

            Connection conn =
            DriverManager.getConnection("jdbc:postgresql://localhost/stud","postgre
            s","password");

            PreparedStatement st=conn.prepareStatement("insert into
            student values(?,?,?)");

```

```

        st.setInt(1, eno);
        st.setString(2, ename);
        st.setFloat(3, percentage);
        st.executeUpdate();
        st.close();
        JOptionPane.showMessageDialog(this, "Inserted");

    } catch (Exception e)
    {
        System.out.println("Error" + e.getMessage());
    }
}
if(e2.getSource()==b2)
{
    try
    {
        Object[] data=new Object[3];
        DefaultTableModel dtm=new DefaultTableModel();
        JTable jt=new JTable(dtm);
        ResultSet rs;
        System.out.println("hello");
        jt.setBounds(20,20,50,50);
        String[] darr={"RollNo", "Name", "Percentage"};
        for(int column=0;column<3;column++)
        {
            dtm.addColumn(darr[column]);
        }
        Connection conn =
DriverManager.getConnection("jdbc:postgresql://localhost/stud", "postgre
s", "password");
        Statement st=conn.createStatement();
        rs=st.executeQuery("select * from student");
        for(row=0;rs.next();row++)
        {
            for(int column=0;column<3;column++)
            {
                data[column]=rs.getObject(column+1);
            }
            dtm.addRow(data);
        }
        rs.close();
        getContentPane().add(new JScrollPane(jt));
    } catch (Exception e)
    {
    }

}
}

public static void main(String[] args)
{
    new StudDb();
}

}

```


Slip NOs -11

1) Design an HTML page which passes customer number to a search servlet. The servlet searches for the customer number in a database (customer table) and returns customer details if found the number otherwise display error message.

```
import java.io.*;
import javax.servlet.*;
import javax.servlet.http.*;
import java.sql.*;
public class servletDatabase extends HttpServlet
{
    Connection cn;
    public void init()
    {
        try
        {
            Class.forName("org.gjt.mm.mysql.Driver");
            cn=DriverManager.getConnection("jdbc:mysql://localhost/stud
", "root", "password");
            System.out.println("Hii");
        }
        catch(Exception ce)
        {
            System.out.println("Error"+ce.getMessage());
        }
    }
    public void doGet(HttpServletRequest req, HttpServletResponse resp)
        throws ServletException, IOException
    {
        resp.setContentType("text/html");
        PrintWriter pw=resp.getWriter();
        try
        {
            int rno=Integer.parseInt(req.getParameter("t1"));
            String qry="Select * from student where
rollno="+rno;
            Statement st=cn.createStatement();
            ResultSet rs=st.executeQuery(qry);
            while(rs.next())
            {
                pw.print("<table border=1>");
                pw.print("<tr>");
```

```

        pw.print("<td>" + rs.getInt(1) + "</td>");
        pw.print("<td>" + rs.getString(2) + "</td>");
        pw.print("<td>" + rs.getFloat(3) + "</td>");
        pw.print("</tr>");
        pw.print("</table>");
    }
}
catch(Exception se){}
pw.close();
}
}

```

HTML File

```

<html>
  <body>
    <form action="http://localhost:8080/servDb/servletDatabase"
method="get">
      Enter Roll No:<input type="text" name="t1">
      <input type="submit">
    </form>
  </body>
</html>

```

```

pssql> create database stud;
Query OK, 1 row affected (0.00 sec)

```

```

pssql> create table student(rollno int primary key,name
text,percentage float);
Query OK, 0 rows affected (0.07 sec)
pssql> insert into student values(1,'student1',79);
Query OK, 1 row affected (0.04 sec)
pssql> insert into student values(2,'student2',69);
Query OK, 1 row affected (0.05 sec)
pssql> insert into student values(3,'student3',58);
Query OK, 1 row affected (0.06 sec)

```

```

pssql> select * from student;

```

2. Write a Java program to display information about all columns in the DONAR table using ResultSetMetaData.

```
import java.sql.*;
import java.io.*;
public class ResultSetMetaData
{
    public static void main(String[] args) throws Exception
    {

        Statement stmt;
        Class.forName("org.postgresql.Driver");
        Connection conn =
        DriverManager.getConnection("jdbc:postgresql://localhost/stud","postgre
s","password");
        stmt = conn.createStatement();
        ResultSet rs = stmt.executeQuery("Select * from student");
        java.sql.ResultSetMetaData rsmd = rs.getMetaData();
        int noOfColumns = rsmd.getColumnCount();
        System.out.println("Number of columns = " + noOfColumns);
        for(int i=1; i<=noOfColumns; i++)
        {
            System.out.println("Column No : " + i);
            System.out.println("Column Name : " + rsmd.getColumnName(i));
            System.out.println("Column Type : " + rsmd.getColumnTypeName(i));
            System.out.println("Column display size : " +
rsmd.getColumnDisplaySize(i));
        }
        conn.close();
    }
}
```

Slip Nos -12

1) Write a JSP program to check whether given number is Perfect or not. (Use Include directive)

Index.html file:

```
<!DOCTYPE html>
<html>
<head>
<title>PERFECT NUMBER</title>
</head>
<body>
<form action="perfect.jsp" method="post">
Enter Number :<input type="text" name="num">
<input type="submit" value="Submit" name="s1">
</form>
</body>
</html>
```

Perfect.jsp file:

```
<%@ page import="java.util.*" %>

<%
if(request.getParameter("s1")!=null)
{
Integer num,a,i,sum = 0;
num = Integer.parseInt(request.getParameter("num"));
a = num;

for(i=1;i<a;i++)
{
if(a%i==0)
{
sum=sum + i;
}
}
if(sum==a)
{
out.println(+num+ "is a perfect number");
}
```

```

}
else
{
out.println(+num+ "is not a perfect number");
}
}
%>

```

Q2) Write a Java Program to create a PROJECT table with field' s project_id, Project_name, Project_description, Project_Status. Insert values in the table. Display all the details of the PROJECT table in a tabular format on the screen. (using swing)

```

import java.sql.*;
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
import java.util.*;

class Slip13_2 extends JFrame implements ActionListener
{
    JLabel l1,l2,l3;
    JTextField t1,t2,t3;
    JButton b1,b2,b3;
    String sql;
    JPanel p,p1;
    Connection con;
    PreparedStatement ps;

    JTable t;
    JScrollPane js;
    Statement stmt ;
    ResultSet rs ;
    ResultSetMetaData rsmd ;
    int columns;

```

```

Vector columnNames = new Vector();
Vector data = new Vector();

Slip13_2()
{
    l1 = new JLabel("Enter no :");
    l2 = new JLabel("Enter name :");
    l3 = new JLabel("percentage :");

    t1 = new JTextField(20);
    t2 = new JTextField(20);
    t3 = new JTextField(20);

    b1 = new JButton("Save");
    b2 = new JButton("Display");
    b3 = new JButton("Clear");

    b1.addActionListener(this);
    b2.addActionListener(this);
    b3.addActionListener(this);

    p=new JPanel();
    p1=new JPanel();
    p.add(l1);
    p.add(t1);
    p.add(l2);
    p.add(t2);
    p.add(l3);
    p.add(t3);

    p.add(b1);
    p.add(b2);
    p.add(b3);

    add(p);
    setLayout(new GridLayout(2,1));
    setSize(600,800);
    setVisible(true);
    setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

}

public void actionPerformed(ActionEvent e)
{
    if((JButton)b1==e.getSource())
    {
        int no = Integer.parseInt(t1.getText());
        String name = t2.getText();
        int p = Integer.parseInt(t3.getText());
        System.out.println("Accept Values");
        try
        {

```

```

        Class.forName("org.postgresql.Driver");
        con=DriverManager.getConnection("jdbc:postgresql://1
92.168.100.254/Bill","oracle","oracle");

        sql = "insert into stud values(?,?,?)";
        ps = con.prepareStatement(sql);
        ps.setInt(1,no);
        ps.setString(2, name);
        ps.setInt(3,p);
        System.out.println("values set");
        int n=ps.executeUpdate();
        if(n!=0)
        {
            JOptionPane.showMessageDialog(null,"Record
inserted ...");
        }
        else
            JOptionPane.showMessageDialog(null,"Record
NOT inserted ");

        } //end of try
        catch(Exception ex)
        {
            System.out.println(ex);
            //ex.printStackTrace();
        }

    } //end of if
    else if((JButton)b2==e.getSource())
    {
        try
        {
            Class.forName("org.postgresql.Driver");
            con=DriverManager.getConnection("jdbc:postgresql://1
92.168.100.254/Bill","oracle","oracle");
            System.out.println("Connected");
            stmt=con.createStatement();
            rs = stmt.executeQuery("select * from stud");
            rsmd = rs.getMetaData();
            columns = rsmd.getColumnCount();

            //Get Columns name
            for(int i = 1; i <= columns; i++)
            {
                columnNames.addElement(rsmd.getColumnNa
me(i));
            }

            //Get row data
            while(rs.next())
            {
                Vector row = new Vector(columns);
                for(int i = 1; i <= columns; i++)
                {

```

```

        row.addElement(rs.getObject(i));
    }
    data.addElement(row);
}

t = new JTable(data, columnNames);
js = new JScrollPane(t);

p1.add(js);
add(p1);

setSize(600, 600);
setVisible(true);
}
catch(Exception e1)
{
    System.out.println(e1);
}
}
else
{
    t1.setText(" ");
    t2.setText(" ");
    t3.setText(" ");
}
}
} //end of method

public static void main(String a[])
{
    Slip13_2 ob = new Slip13_2();
}
}

```


Slip Nos 13

Q1) Write a Java program to display information about the database and list all the tables in the database. (Use DatabaseMetaData).

```
import java.sql.*;
import java.io.*;
public class DBMetaData
{
    public static void main(String[] args) throws Exception
    {
        ResultSet rs = null;
        Class.forName("org.postgresql.Driver");
        Connection conn =
        DriverManager.getConnection("jdbc:postgresql://localhost/dbtry","postgr
es","redhat");
        DatabaseMetaData dbmd = conn.getMetaData();
        System.out.println("Database Product name = " +
        dbmd.getDatabaseProductName());
        System.out.println("User name = " + dbmd.getUserName());
        System.out.println("Database driver name= " +
        dbmd.getDriverName());
        System.out.println("Database driver version = "+
        dbmd.getDriverVersion());
        System.out.println("Database product name = " +
        dbmd.getDatabaseProductName());
        System.out.println("Database Version = " +
        dbmd.getDriverMajorVersion());
        rs = dbmd.getTables(null,null,null, new String[]{"TABLE"});
        System.out.println("List of tables...");
        while(rs.next())
        {
            String tblName = rs.getString("TABLE_NAME");
            System.out.println("Table : "+ tblName);
        }
        conn.close();
    }
}
```

Q2) Write a Java program to show lifecycle (creation, sleep, and dead) of a thread. Program should print randomly the name of thread and value of sleep time. The name of the thread should be hard coded through constructor. The sleep time of a thread will be a random integer in the range 0 to 4999.

```
Class MyThread extends Thread
{ public MyThread(String s)
{
super(s);
}
public void run()
{
System.out.println(getName()+"thread created.");
while(true)
{
System.out.println(this);
int s=(int)(math.random()*5000);
System.out.println(getName()+"is sleeping for :+s+"msec");
try{
Thread.sleep(s);
}
catch(Exception e)
{
}
}
}
Class ThreadLifeCycle
{
public static void main(String args[])
{
MyThread t1=new MyThread("shradha"),t2=new MyThread("pooja");
t1.start();
t2.start();
try
{
t1.join();
t2.join();
}
catch(Exception e)
{
}
System.out.println(t1.getName()+"thread dead.");
System.out.println(t2.getName()+"thread dead.");
}
}
```

Slip Nos 14

Q1) Write a Java program for a simple search engine. Accept a string to be searched. Search the string in all text files in the current folder. Use a separate thread for each file. The result should display the filename and line number where the string is found.

```
import java.io.*;

public class SearchThread extends Thread
{
    File f1;
    String fname;
    static String str;
    String line;
    LineNumberReader reader = null;
    SearchThread(String fname)
    {
        this.fname=fname;
        f1=new File(fname);
    }
    public void run()
    {
        try
        {
            FileReader fr=new FileReader(f1);
            reader=new LineNumberReader(fr);
            while((line=reader.readLine())!=null)
            {
                if(line.indexOf(str)!=-1)
                {
                    System.out.println("string found in "+fname+"at "+reader.getLineNumber()+"line");
                    stop();
                }
            }
        }
        catch(Exception e)
        {
        }
    }
    public static void main(String[] args) throws IOException
    {
        Thread t[]=new Thread[20];
        BufferedReader br=new BufferedReader(new
        InputStreamReader(System.in));
        System.out.println("Enter String to search");
        str=br.readLine();
    }
}
```

```

FilenameFilter filter = new FilenameFilter()
{
    public boolean accept(File file, String name)
    {
        if (name.endsWith(".txt"))
        {
            return true;
        }
        else
        {
            return false;
        }
    }
};

File dir1 = new File(".");
File[] files = dir1.listFiles(filter);
if (files.length == 0)
{
    System.out.println("no files available with this extension");
}
else
{
    for(int i=0;i<files.length;i++)
    {
        for (File aFile : files)
        {
            t[i]=new SearchThread(aFile.getName());
            t[i].start();
        }
    }
}
}
}

```

Q2) Write a JSP program to calculate sum of first and last digit of a given number. Display sum in Red Color with font size 18.

HTML FILE

```
<!DOCTYPE html>
<html>
<body>
<form method=post action="Slip7.jsp">
Enter Any Number : <Input type=text name=num><br><br>
<input type=submit value=Display>
</form>
</body>
</html>
```

JSP FILE:

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<body>
<%! int n,rem,r; %>
<% n=Integer.parseInt(request.getParameter("num"));
    if(n<10)
    {
        out.println("Sum of first and last digit is ");
%><font size=18 color=red><%= n %></font>
<%
    }
    else
    {
        rem=n%10;
        do{
            r=n%10;
            n=n/10;
        }while(n>0);
        n=rem+r;
        out.println("Sum of first and last digit is ");
%><font size=18 color=red><%= n %></font>
<%
    }
%>
</body>
</html>
```

Slip Nos 15

Q1) Write a java program to display name and priority of a Thread

```
public class MainThread

{

    public static void main(String arg[])

    {

        Thread t=Thread.currentThread();

        System.out.println("Current Thread:"+t);//Change Name
        t.setName("My Thread ");

        System.out.println ("After the name is Changed:"+t);

        try    {

            for(int i=2;i>0;i--)

            {

                System.out.println(i);

                Thread.sleep(1000);

            }

        }

    }

}
```

```
        catch(Exception e)

        {

            System.out.println(e);

        }

    }

}
```

Q2) Write a SERVLET program which counts how many times a user has visited a web page. If user is visiting the page for the first time, display a welcome message. If the user is revisiting the page, display the number of times visited. (Use Cookie)

```
import java.io.*;

import javax.servlet.*;

import javax.servlet.http.*;public class VisitServlet extends
HttpServlet

{

    static int i=1;
```

```
public void doGet(HttpServletRequest request,HttpServletResponse  
response)
```

```
throws IOException,ServletException
```

```
{
```

```
response.setContentType("text/html");
```

```
PrintWriter out=response.getWriter();
```

```
String k=String.valueOf(i);
```

```
Cookie c=new Cookie("visit",k);
```

```
response.addCookie(c);
```

```
int j=Integer.parseInt(c.getValue());
```

```
if(j==1)
```

```
{
```

```
out.println("Welcome to web page ");
```

```
}
```

```
else    {
```

```
out.println("You are visited at "+i+" times");
```

```
}
```



```
i++;
```

```
}
```

}Web.xml

```
<?xml version="1.0" encoding="ISO-8859-1"?>
```

```
<web-app>
```

```
<servlet>
```

```
<servlet-name>VisitServlet</servlet-name>
```

```
<servlet-class>VisitServlet</servlet-class>
```

```
</servlet>
```

```
36<servlet-mapping>
```

```
<servlet-name>VisitServlet</servlet-name>
```

```
<url-pattern>/VS</url-pattern>
```

```
</servlet-mapping>
```

```
</web-app>
```

Slip NO-16

