JAVA Assignment 3: MODULE 2

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1)Write a RMI application to do the following:

Client will accept a string from user and communicate to the server.

Client will invoke find Vowel Count – remote method
on server, using accepted string and display vowel count from that string.

VowelCountServer.java:-

```
import java.rmi.registry.*;

public class VowelCountServer {
    public static void main(String[] args) {
        try {
            VowelCountImpl vc = new VowelCountImpl();
            Registry registry = LocateRegistry.createRegistry(1550);
            registry.bind("VowelCount", vc);
            System.out.println("Server ready");
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

VowelCount.java:-

```
import java.rmi.*;

public interface VowelCount extends Remote {
    public int findVowelCount(String str) throws RemoteException;
}
```

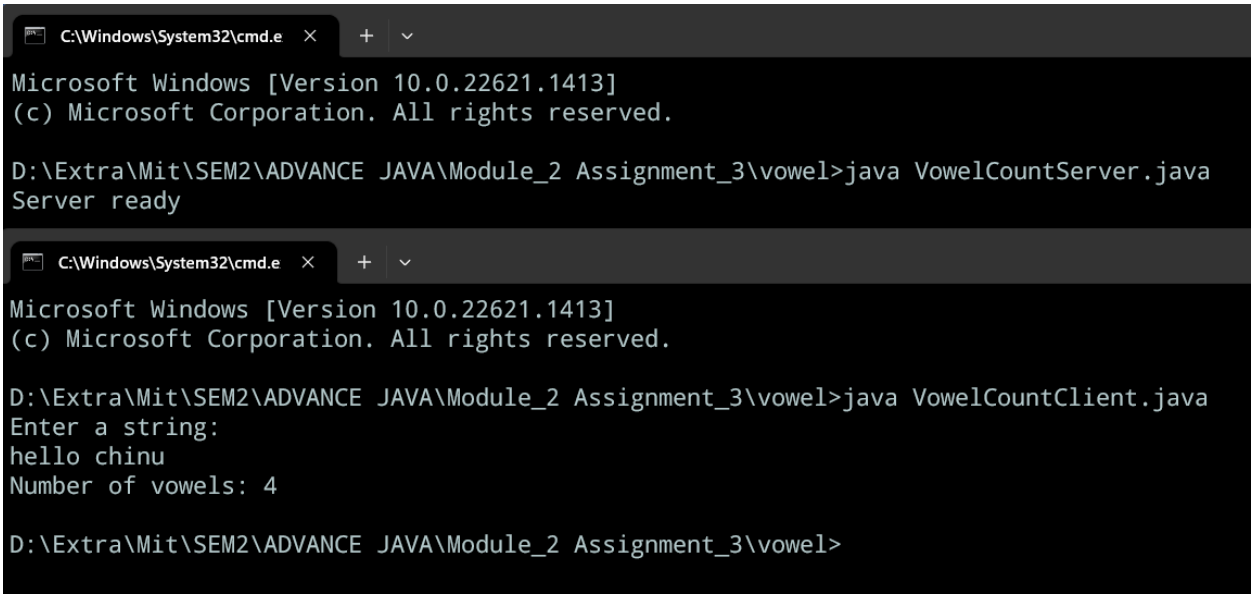
VowelCountClient.java:-

```
import java.rmi.*;
import java.util.Scanner;

public class VowelCountClient {
    public static void main(String[] args) {
        try {
            String url = "rmi://localhost:1550/VowelCount";
            VowelCount vc = (VowelCount) Naming.lookup(url);
            Scanner sc = new Scanner(System.in);
            System.out.println("Enter a string: ");
            String str = sc.nextLine();
            int count = vc.findVowelCount(str);
            System.out.println("Number of vowels: " + count);
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

VowelCountImpl.java:-

```
import java.rmi.*;
import java.rmi.server.*;

public class VowelCountImpl extends UnicastRemoteObject implements
VowelCount {
    public VowelCountImpl() throws RemoteException {
        super();
    }

    public int findVowelCount(String str) throws RemoteException {
        int count = 0;
        String strr = str.toLowerCase();
        for (int i = 0; i < strr.length(); i++) {
            char ch = strr.charAt(i);
            if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch
== 'u') {
                count++;
            }
        }
        return count;
    }
}
```

OUTPUT:-


C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1413]
(c) Microsoft Corporation. All rights reserved.
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\vowel>java VowelCountServer.java
Server ready
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1413]
(c) Microsoft Corporation. All rights reserved.
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\vowel>java VowelCountClient.java
Enter a string:
hello chinu
Number of vowels: 4
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\vowel>

2) Write all required classes or interfaces.

It is difficult to provide a comprehensive list of all classes or interfaces required in Java as it would depend on the specific needs of a project or application. However, some of the commonly used classes and interfaces in Java include:

- Object: the root class of all Java classes.
- String: used to represent text as a sequence of characters.
- List: an interface that defines a collection for storing elements in a specific order.
- Map: an interface that defines a collection for storing key-value pairs.
- Set: an interface that defines a collection for storing unique elements.
- Collection: an interface that defines the basic operations for working with collections.
- Iterator: an interface that provides a way to iterate over elements in a collection.
- Comparable: an interface that allows objects to be compared to each other.
- Runnable: an interface that defines a single method for running a task in a separate thread.
- Thread: a class that represents a separate thread of execution.
- InputStream: an abstract class for reading input streams of bytes.
- OutputStream: an abstract class for writing output streams of bytes.
- FileReader: a class for reading text files.
- FileWriter: a class for writing text files.
- Date: a class for working with dates and times.
- Calendar: a class for working with dates and times in a more flexible way than Date.
- Math: a class that provides mathematical functions.
- Random: a class that generates random numbers.
- Exception: a class that represents an error or exception in the program.
- Serializable: an interface that allows objects to be serialized and deserialized.

This is just a small selection of the many classes and interfaces available in Java. The specific requirements of a project or application will determine which classes and interfaces are needed.

3) Write a Program to implement stack using RMI.

Stck.java:-

```
import java.rmi.*;

public interface stck extends Remote {
    public void push(int item) throws Exception;

    public int pop() throws Exception;

    public int peek() throws Exception;

    public boolean isEmpty() throws RemoteException;
}
```

Stckimpl.java:-

```
import java.rmi.*;
import java.rmi.server.*;
import java.util.Stack;

public class stckimpl extends UnicastRemoteObject implements stck {
    private Stack<Integer> stack;

    public stckimpl() throws RemoteException {
        super();
        stack = new Stack<Integer>();
    }

    public void push(int item) throws RemoteException {
        stack.push(item);
    }

    public int pop() throws RemoteException {
        return stack.pop();

    }

    public int peek() throws RemoteException {
        return stack.peek();
    }

    public boolean isEmpty() throws RemoteException {
        return stack.isEmpty();
    }

}
```

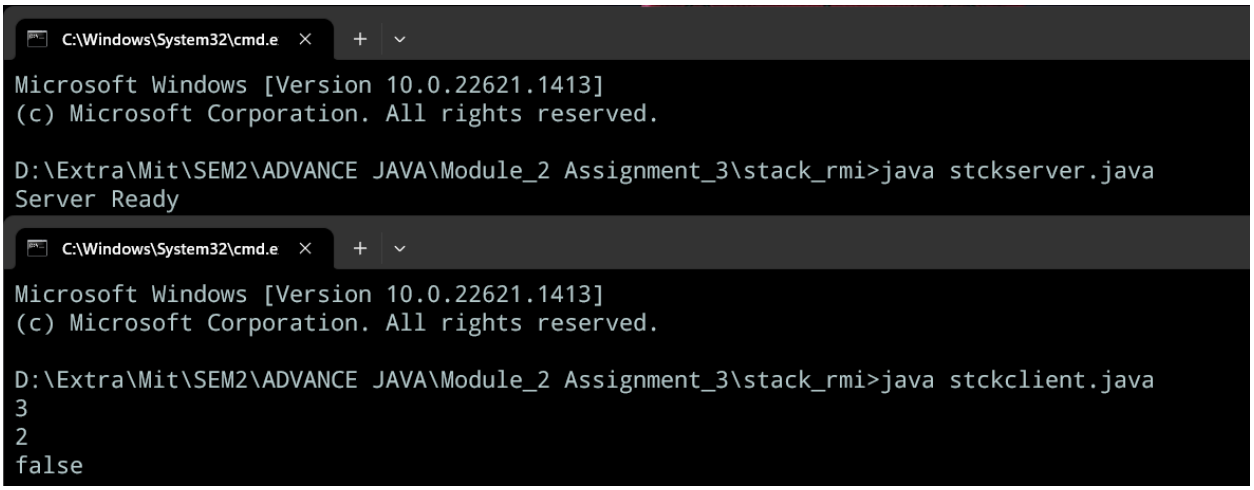
Stckserver.java:-

```
import java.rmi.registry.*;

public class stckserver {

    public static void main(String[] args) {
        try {
            stckimpl sti = new stckimpl();
            Registry registry = LocateRegistry.createRegistry(1450);
            registry.bind("stck", sti);
            System.out.println("Server Ready");
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

Stckclient.java:-

```
import java.rmi.*;

public class stckclient {
    public static void main(String[] args) {
        try {
            String url = "rmi://localhost:1450/stck";
            stck sti = (stck) Naming.lookup(url);
            sti.push(1);
            sti.push(2);
            sti.push(3);
            System.out.println(sti.pop()); // should print 3
            System.out.println(sti.peek()); // should print 2
            System.out.println(sti.isEmpty()); // should print false
        } catch (Exception e) {
            System.out.println(e);
        }
    }
```

OUTPUT:-


C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1413]
(c) Microsoft Corporation. All rights reserved.
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\stack_rmi>java stckserver.java
Server Ready
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1413]
(c) Microsoft Corporation. All rights reserved.
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\stack_rmi>java stckclient.java
3
2
false

4) Write a program to print sum of diagonal elements of array using RMI.

Matrixmul.java:-

```
import java.rmi.*;

public interface matrixmul extends Remote {
    public String multi(int a[][]) throws RemoteException;

    public String showmatrix(int a[][]) throws RemoteException;
}
```

Matrixmulimpl.java:-

```
import java.rmi.*;
import java.rmi.server.*;
// import java.io.*;
// import java.util.*;

public class matrixmulimpl extends UnicastRemoteObject implements
matrixmul {
    public matrixmulimpl() throws RemoteException {
        super();
    }

    public String multi(int a[][]) throws RemoteException {
        int suml = 0, sumr = 0;

        for (int i = 0; i < a.length; i++) {
            for (int j = 0; j < a.length; j++) {
                if (i == j) {
                    suml += a[i][j];
                }
                if (i + j == a.length - 1) {
                    sumr += a[i][j];
                }
            }
        }

        return ("\nThe sum of the diagonal elements of the matrix you
entered is: " + suml
                + "\n The sum of min diagonal elements is " + sumr);

    }

    public String showmatrix(int a[][]) throws RemoteException {
        StringBuilder sb = new StringBuilder();
        sb.append("The matrix is ..>>\n");
        for (
```

```
                int i = 0; i < (a.length); i++) {
            sb.append("\n");
            for (int j = 0; j < (a.length); j++) {
                sb.append(a[i][j] + " ");

            }
        }
        return sb.toString();

    }
}
```

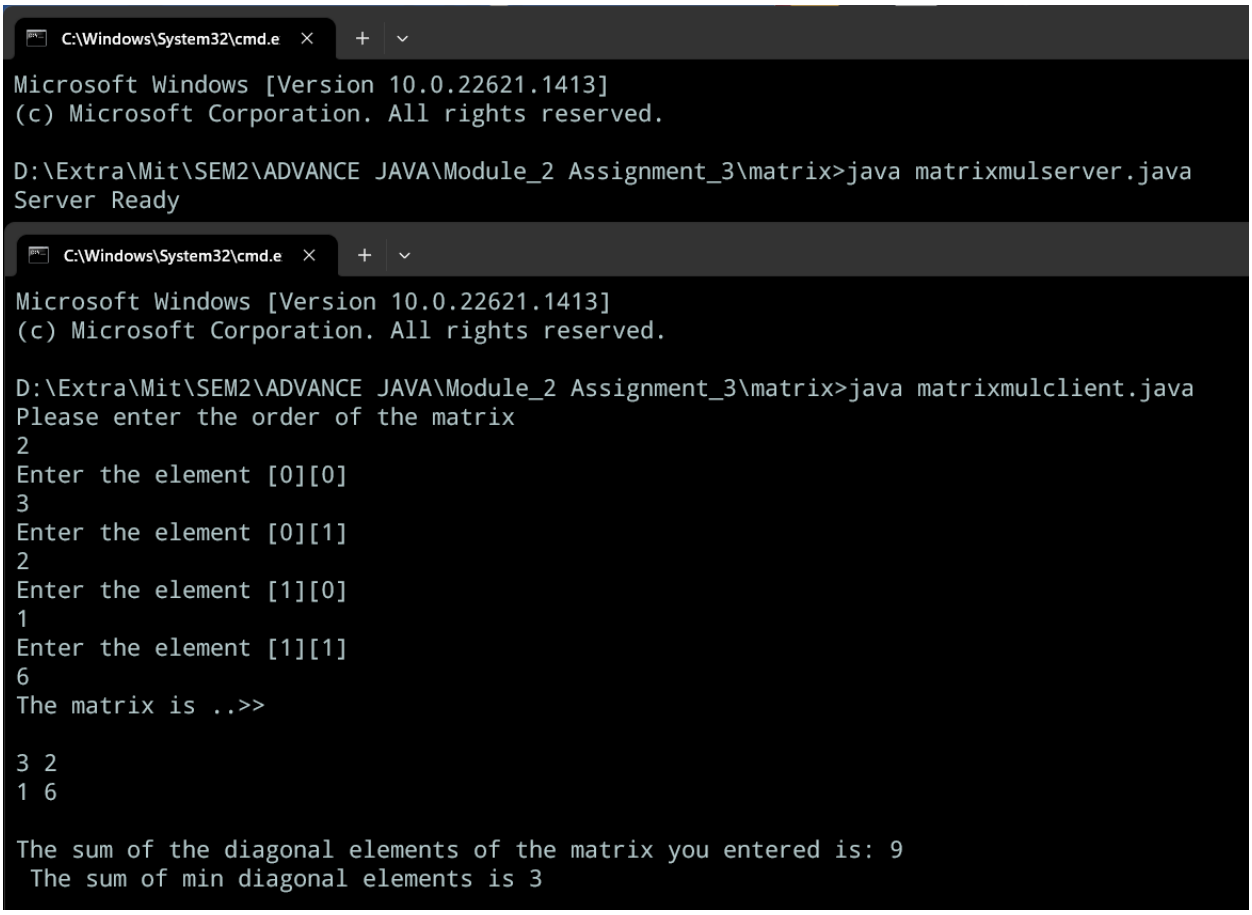
Matrixmulserver.java:-

```
import java.rmi.registry.*;

public class matrixmulserver {
    public static void main(String[] args) {
        try {
            matrixmulimpl mmi = new matrixmulimpl();
            Registry registry = LocateRegistry.createRegistry(1500);
            registry.bind("matrixmul", mmi);
            System.out.println("Server Ready");
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

Matrixmulclient.java:-

```
import java.rmi.Naming;
import java.util.*;

public class matrixmulclient {
    public static void main(String[] args) {
        try {
            String url = "rmi://localhost:1500/matrixmul";
            matrixmul mmi = (matrixmul) Naming.lookup(url);
            Scanner sc = new Scanner(System.in);
            System.out.println("Please enter the order of the matrix");
            int n = sc.nextInt();
            int a[][] = new int[n][n];
            for (int i = 0; i < n; i++) {
                for (int j = 0; j < n; j++) {
                    System.out.println("Enter the element [" + i + "]["
+ j + "]");
                    a[i][j] = sc.nextInt();
                }
            }
            System.out.println(mmi.showmatrix(a));
            System.out.println(mmi.multi(a));

        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

OUTPUT:-


C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1413]
(c) Microsoft Corporation. All rights reserved.
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\matrix>java matrixmulserver.java
Server Ready
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1413]
(c) Microsoft Corporation. All rights reserved.
D:\Extra\Mit\SEM2\ADVANCE JAVA\Module_2 Assignment_3\matrix>java matrixmulclient.java
Please enter the order of the matrix
2
Enter the element [0][0]
3
Enter the element [0][1]
2
Enter the element [1][0]
1
Enter the element [1][1]
6
The matrix is ..>>
3 2
1 6
The sum of the diagonal elements of the matrix you entered is: 9
The sum of min diagonal elements is 3

5) Write a Program to reverse string using RMI.

Stringreverse.java:-

```
import java.rmi.*;

public interface stringreverse extends Remote {
    public String ReverseString(String str) throws RemoteException;
}
```

Stringreverseimpl.java:-

```
import java.rmi.*;
import java.rmi.server.*;

public class stringreverseimpl extends UnicastRemoteObject implements
stringreverse {
    public stringreverseimpl() throws RemoteException {
        super();
    }

    public String ReverseString(String str) throws RemoteException {
        StringBuffer sbt = new StringBuffer(str);
        sbt.reverse();
        String str2 = sbt.toString();
        return str2;
    }
}
```

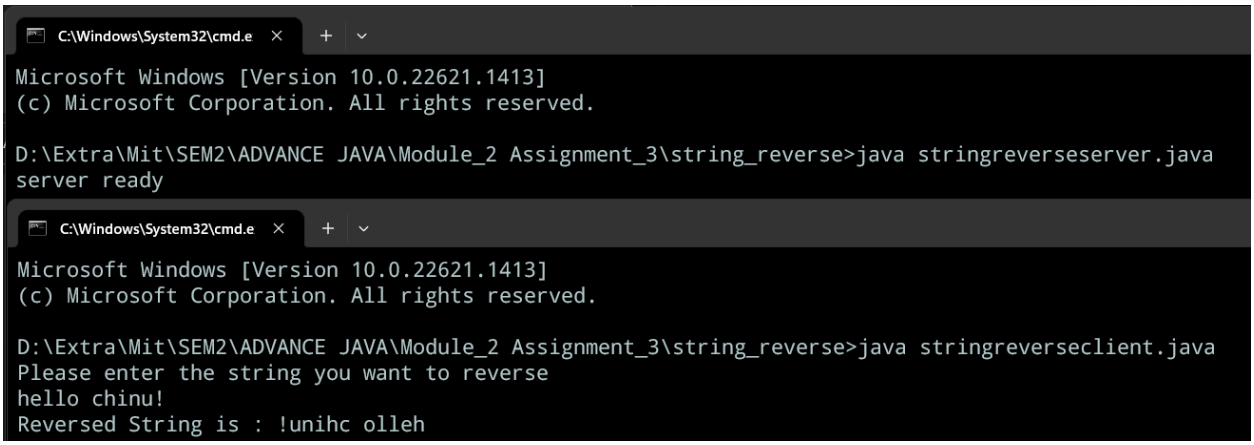
Stringreverseserver.java:-

```
import java.rmi.registry.*;

public class stringreverseserver {
    public static void main(String args[]) {
        try {
            stringreverseimpl sri = new stringreverseimpl();
            Registry registry = LocateRegistry.createRegistry(1450);
            registry.bind("stringreverse", sri);
            System.out.println("server ready");
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

Stringreverseclient.java:-

```
import java.rmi.*;
import java.util.Scanner;

public class stringreverseclient {
    public static void main(String args[]) {
        try {
            String url = "rmi://localhost:1450/stringreverse";
            stringreverse sri = (stringreverse) Naming.lookup(url);
            Scanner sc = new Scanner(System.in);
            System.out.println("Please enter the string you want to
reverse");
            String dmo = sc.nextLine();
            String lmo = sri.ReverseString(dmo);
            System.out.println("Reversed String is : " + lmo);
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

OUTPUT:-



6) Write a program to read file and count no of words, characters and special symbols using RMI.

Flcount.java:-

```
import java.rmi.*;

public interface flcount extends Remote {
    public String counters(String str) throws RemoteException;
}
```

Flcountimpl.java:-

```
import java.rmi.*;
import java.rmi.server.*;
import java.io.*;

public class flcountimpl extends UnicastRemoteObject implements flcount
{
    public flcountimpl() throws RemoteException {
        super();
    }

    public String counters(String str) throws RemoteException {
        File file = new File(str);
        int c = 0, w = 0, s = 0;
        String drs = "";
        try {
            BufferedReader br = new BufferedReader(new FileReader(file));
            String st;
            while ((st = br.readLine()) != null) {
                String sr = st;
                String words[] = sr.split(" ");
                w = w + words.length;
                for (String word : words)
                    c = c + word.length();
                for (int i = 0; i < st.length(); i++) {
                    char ee = st.charAt(i);
                    if        (!Character.isLetterOrDigit(ee)        &&
!Character.isWhitespace(ee)) {
                        s++;
                    }

                }

            }
```

```
            drs = "Number of words in the given file: " + w + "\nNumber
of characters in the given file: " + c
                    + " and the number of special characters in the file
is " + s;
        } catch (FileNotFoundException e) {
            drs = "File not found";
        } catch (IOException e) {
            drs = "Error reading file";
        } catch (Exception e) {
            drs = "Unexpected error: " + e.getMessage();
        }
        return drs;
    }
}
```

Flcountserver.java:-

```
import java.rmi.registry.*;

public class flcountserver {
    public static void main(String[] args) {
        try {
            flcountimpl fci = new flcountimpl();
            Registry registry = LocateRegistry.createRegistry(1440);
            registry.bind("flcount", fci);
            System.out.println("Server Ready");
        } catch (Exception e) {
            System.out.println(e);
        }
    }
}
```

Flcountclient.java:-

```
import java.rmi.*;
import java.util.Scanner;

public class flcountclient {
    public static void main(String[] args) {
        try {
            String url = "rmi://localhost:1440/flcount";
            flcount fci = (flcount) Naming.lookup(url);
            Scanner sc = new Scanner(System.in);
```

```
            System.out.println("Please enter the file name you want to
count the characters of");
            String fname = sc.nextLine();
            System.out.println(fci.counters(fname));
        } catch (Exception e) {
            System.out.println(e);
        }

    }
}
```

OUTPUT:-