

## 2 Applet GUI

### 2.2 Write an applet program to create following GUI structure

#### 2.2.1 Source of 1a.java

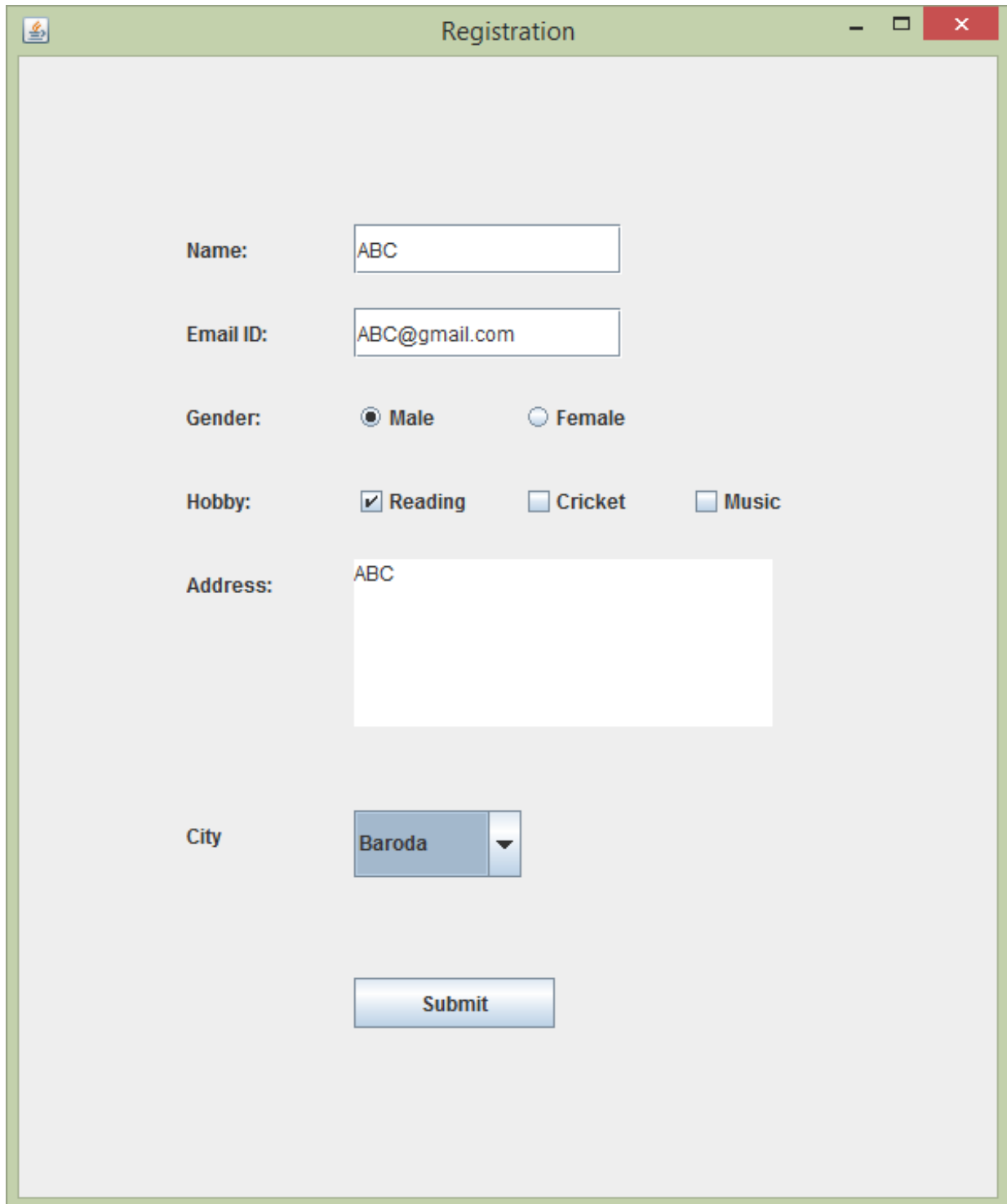
```
1 package swing;
2 import javax.swing.*;
3 import java.awt.*;
4 public class info extends JFrame {
5     JLabel l1;
6     JLabel l2;
7     JLabel l3;
8     JLabel l4;
9     JLabel l5;
10    JLabel l6;
11    JTextField name;
12    JTextField email;
13    JTextArea address;
14    JRadioButton Male, Female;
15    JCheckBox Cricket, Music, Reading;
16    JComboBox jcb;
17    JButton Submit;
18    Container c;
19    ButtonGroup bg;
20    public info() {
21        c = this.getContentPane();
22        c.setLayout(null);
23        l1 = new JLabel();
24        l2 = new JLabel();
25        l3 = new JLabel();
26        l4 = new JLabel();
27        l5 = new JLabel();
28        l6 = new JLabel();
29        l1.setText("Name:");
30        l2.setText("Email ID:");
31        l3.setText("Gender:");
32        l4.setText("Hobby:");
33        l5.setText("Address:");
34        l6.setText("City");
35        name = new JTextField(15);
36        email = new JTextField(15);
37        address = new JTextArea(3, 8);
38        String[] data = {"Surat", "Baroda", "Ahemdabad"};
39        jcb = new JComboBox(data);
40        bg = new ButtonGroup();
41        Male = new JRadioButton("Male");
42        Female = new JRadioButton("Female");
43        Cricket = new JCheckBox("Cricket");
44        Music = new JCheckBox("Music");
45        Reading = new JCheckBox("Reading");
46        Submit = new JButton("Submit");
47        l1.setBounds(100, 100, 60, 30);
```

## Doughnut Maker

120120120120

A

```
48         name.setBounds(200, 100, 160, 30);
49         l2.setBounds(100, 150, 80, 30);
50         email.setBounds(200, 150, 160, 30);
51         l3.setBounds(100, 200, 80, 30);
52         Male.setBounds(200, 200, 60, 30);
53         Female.setBounds(300, 200, 100, 30);
54         l4.setBounds(100, 250, 60, 30);
55         Reading.setBounds(200, 250, 80, 30);
56         Cricket.setBounds(300, 250, 80, 30);
57         Music.setBounds(400, 250, 80, 30);
58         l5.setBounds(100, 300, 60, 30);
59         address.setBounds(200, 300, 250, 100);
60         l6.setBounds(100, 450, 40, 30);
61         jcb.setBounds(200, 450, 100, 40);
62         Submit.setBounds(200, 550, 120, 30);
63         c.add(l1);
64         c.add(name);
65         c.add(l2);
66         c.add(email);
67         c.add(l3);
68         bg.add(Male);
69         bg.add(Female);
70         c.add(Male);
71         c.add(Female);
72         c.add(l4);
73         c.add(Reading);
74         c.add(Cricket);
75         c.add(Music);
76         c.add(l5);
77         c.add(address);
78         c.add(l6);
79         c.add(jcb);
80         c.add(Submit);
81     }
82     public static void main(String atgs[]) {
83         info pr = new info();
84         pr.setVisible(true);
85         pr.setEnabled(true);
86         pr.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
87         pr.setSize(600, 720);
88         pr.setTitle("Registration");
89     }
90 }
```



The image shows a Java Swing window titled "Registration". It contains a registration form with the following fields and controls:

- Name:** A text input field containing "ABC".
- Email ID:** A text input field containing "ABC@gmail.com".
- Gender:** Two radio buttons labeled "Male" (selected) and "Female".
- Hobby:** Three checkboxes labeled "Reading" (checked), "Cricket", and "Music".
- Address:** A large text area containing "ABC".
- City:** A dropdown menu currently showing "Baroda".
- Submit:** A blue button with the text "Submit".

*Output 2.2.1.1*

## 2.3 Write an applet program to create following GUI structure

### 2.3.1 Source of 1b.java

```
1 package swing;
2 import javax.swing.*;
3 import java.awt.event.*;
4 import java.awt.*;
5
6 public class cal extends JApplet implements
7     ActionListener {
8     Container c;
9     JLabel l1 = new JLabel();
10    JLabel l2 = new JLabel();
11    JLabel l3 = new JLabel();
12    JTextField no1 = new JTextField(4);
13    JTextField no2 = new JTextField(4);
14    JTextField no3 = new JTextField(4);
15    JButton addd = new JButton("+");
16    JButton subb = new JButton("-");
17    JButton mull = new JButton("*");
18    JButton divv = new JButton("/");
19
20    public void init() {
21        c = this.getContentPane();
22        c.setLayout(null);
23        l1.setText("Enter No 1:");
24        l2.setText("Enter No 1:");
25        l3.setText("Answer");
26        l1.setForeground(Color.BLACK);
27        l2.setForeground(Color.BLACK);
28        l3.setForeground(Color.BLACK);
29        l1.setBounds(525, 200, 90, 35);
30        no1.setBounds(625, 200, 90, 35);
31        l2.setBounds(525, 270, 90, 35);
32        no2.setBounds(625, 270, 90, 35);
33        l3.setBounds(525, 400, 90, 35);
34        no3.setBounds(625, 400, 90, 35);
35        addd.setBounds(400, 500, 70, 40);
36        subb.setBounds(550, 500, 70, 40);
37        mull.setBounds(700, 500, 70, 40);
38        divv.setBounds(850, 500, 70, 40);
39        c.add(l1);
40        c.add(no1);
41        c.add(l2);
42        c.add(no2);
43        c.add(l3);
44        c.add(no3);
45        c.add(addd);
46        c.add(subb);
47        c.add(mull);
48        c.add(divv);
49        no1.addActionListener(this);
```

```
50         no2.addActionListener(this);
51     no3.addActionListener(this);
52     addd.addActionListener(this);
53     subb.addActionListener(this);
54     mull.addActionListener(this);
55     divv.addActionListener(this);
56 }
57
58 @Override
59 public void actionPerformed(ActionEvent ae) {
60     String str = ae.getActionCommand();
61     int ans = 1;
62
63     if(no1.getText() != "" && no2.getText() != "") {
64         if(str.equals("+")) {
65             ans = Integer.parseInt(no1.getText()) +
66                 Integer.parseInt(no2.getText());
67
68         } else if(str.equals("-")) {
69             ans = Integer.parseInt(no1.getText()) -
70                 Integer.parseInt(no2.getText());
71
72         } else if(str.equals("*")) {
73             ans =
74                 Integer.parseInt(no1.getText()) *
75                 Integer.parseInt(no2.getText());
76
77         } else if(str.equals("/")) {
78             ans = Integer.parseInt(no1.getText()) /
79                 Integer.parseInt(no2.getText());
80         }
81
82         System.out.println(ans);
83         no3.setText(Integer.toString(ans));
84     }
85 }
86 }
```

**Enter No 1:**

1

**Enter No 1:**

2

**Answer**

3

+

-

\*

/

*Output 2.3.1.1*

### 3 Swing application

#### 3.1 Develop a swing application using event handling

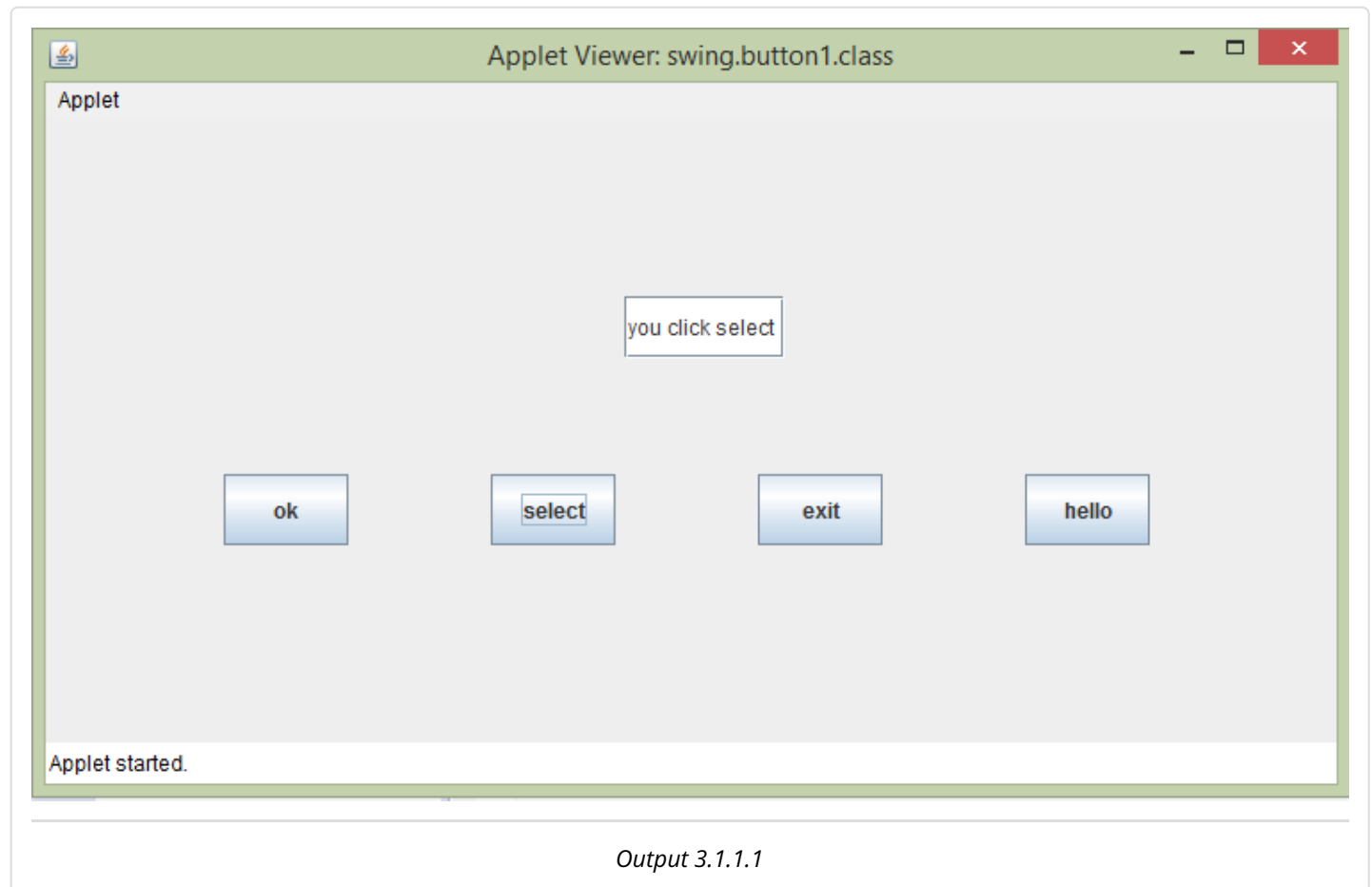
##### 3.1.1 Source of 2a.java

```

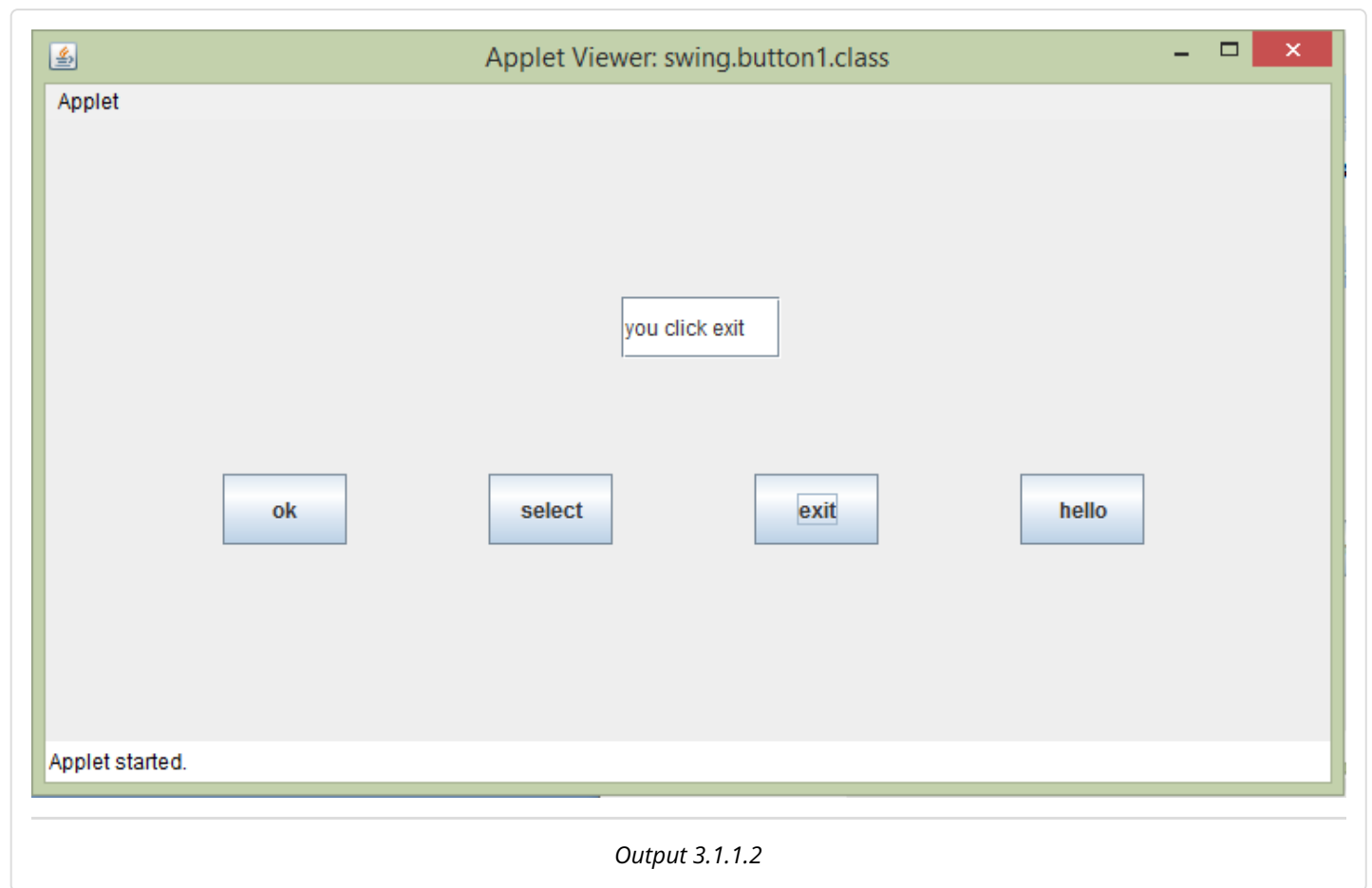
1 package swing;
2 package swing;
3
4 import java.awt.Container;
5 import java.awt.event.ActionEvent;
6 import java.awt.event.ActionListener;
7
8 import javax.swing.JApplet;
9 import javax.swing.JButton;
10 import javax.swing.JLabel;
11 import javax.swing.JTextField;
12
13 public class button1 extends JApplet implements
14     ActionListener {
15     Container c;
16
17     JButton ok = new JButton("ok");
18     JButton select = new JButton("select");
19     JButton exit = new JButton("exit");
20     JButton hello = new JButton("hello");
21     JTextField ans = new JTextField(15);
22
23     public button1() {
24         c = this.getContentPane();
25         c.setLayout(null);
26         ans.setBounds(625, 400, 90, 35);
27         ok.setBounds(400, 500, 70, 40);
28         select.setBounds(550, 500, 70, 40);
29         exit.setBounds(700, 500, 70, 40);
30         hello.setBounds(850, 500, 70, 40);
31         c.add(ans);
32         c.add(ok);
33         c.add(select);
34         c.add(exit);
35         c.add(hello);
36         ok.addActionListener(this);
37         select.addActionListener(this);
38         exit.addActionListener(this);
39         hello.addActionListener(this);
40     }
41     @Override
42     public void actionPerformed(ActionEvent e) {
43         String str = e.getActionCommand();
44
45         if(str.equals("ok")) {
46             ans.setText("you click ok");
47

```

```
48         } else if(str.equals("select")) {  
49             ans.setText("you click select");  
50  
51         } else if(str.equals("exit")) {  
52             ans.setText("you click exit");  
53  
54         } else {  
55             ans.setText("you click hello");  
56         }  
57     }  
58 }
```





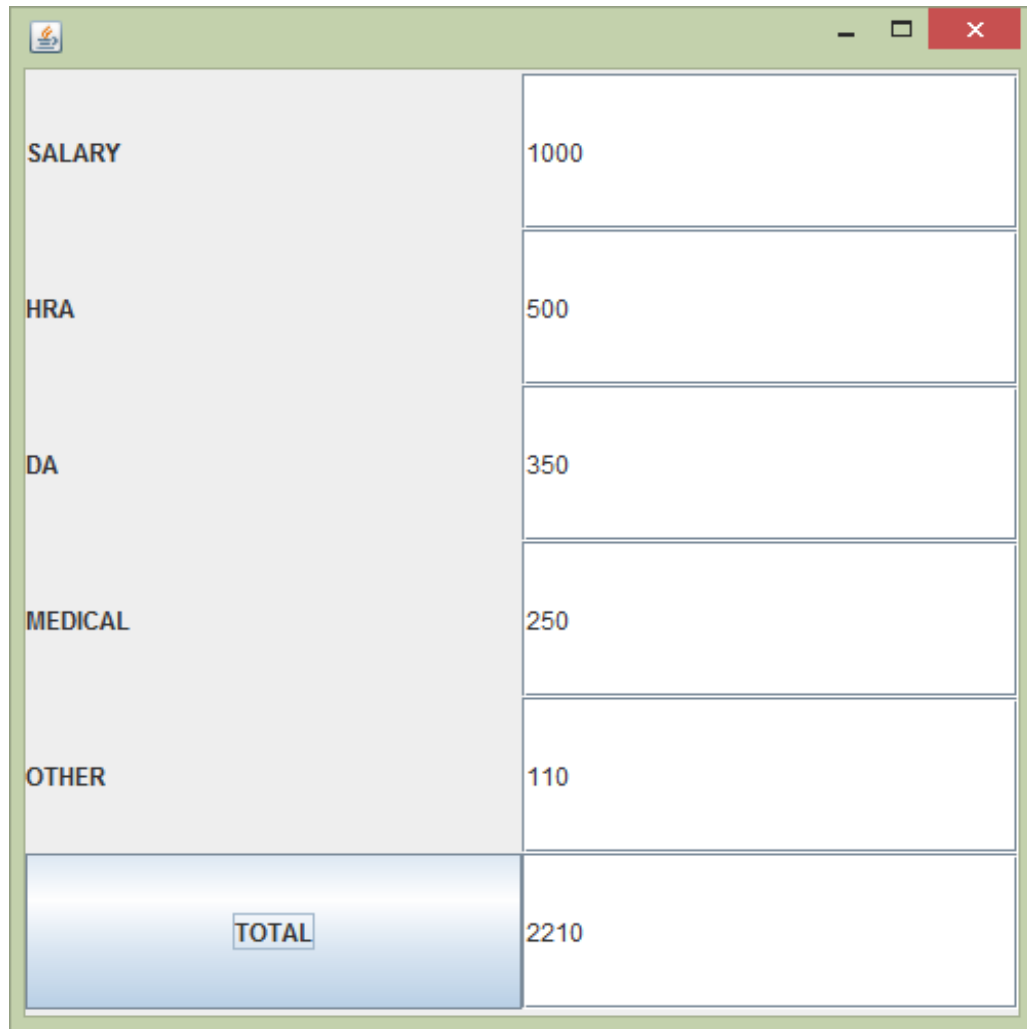


## 3.2 Develop a swing application with different layouts

### 3.2.1 Source of 2b.java

```
1 package swing;
2
3 import java.awt.Container;
4 import java.awt.GridLayout;
5 import java.awt.event.ActionEvent;
6 import java.awt.event.ActionListener;
7 import javax.swing.JButton;
8 import javax.swing.JFrame;
9 import javax.swing.JLabel;
10 import javax.swing.JPanel;
11 import javax.swing.JTextField;
12
13 public class salary {
14     public static void main(String s[]) {
15         count c1 = new count();
16         c1.setVisible(true);
17     }
18 }
19
20 class count extends JFrame implements
21     ActionListener {
22     JLabel l1, l2, l3, l4, l5;
23     JTextField t1, t2, t3, t4, t5, total1;
24     JButton b1;
25     Container c;
26     JPanel p1;
27     count() {
28         c = new Container();
29         setSize(500, 500);
30         p1 = new JPanel();
31         b1 = new JButton("TOTAL");
32         l1 = new JLabel("SALARY");
33         l2 = new JLabel("HRA");
34         l3 = new JLabel("DA");
35         l4 = new JLabel("MEDICAL");
36         l5 = new JLabel("OTHER");
37         t1 = new JTextField(10);
38         t2 = new JTextField(10);
39         t3 = new JTextField(10);
40         t4 = new JTextField(10);
41         t5 = new JTextField(10);
42         total1 = new JTextField(10);
43         setLayout(new GridLayout(6, 2));
44         add(l1);
45         add(t1);
46         add(l2);
47         add(t2);
48         add(l3);
49         add(t3);
```

```
50         add(l4);
51     add(t4);
52     add(l5);
53     add(t5);
54     add(b1);
55     add(total1);
56     c.add(p1);
57     b1.addActionListener(this);
58 }
59
60 @Override
61 public void actionPerformed(ActionEvent arg0) {
62     // TODO Auto-generated method stub
63     String str = arg0.getActionCommand();
64     double ans = 0;
65     double a, b, c, d, e;
66
67     if(t1.getText() != "" && t2.getText() != "" &&
68         t3.getText() != "" && t4.getText() != "" &&
69         t5.getText() != "") {
70         a = Integer.parseInt(t1.getText());
71         b = a * (.50);
72         System.out.println(b);
73         t2.setText(Integer.toString((int) b));
74         c = a * (.35);
75         System.out.println(c);
76         t3.setText(Integer.toString((int) c));
77         d = a * (.25);
78         System.out.println(d);
79         t4.setText(Integer.toString((int) d));
80         e = a * (.11);
81         System.out.println(e);
82         t5.setText(Integer.toString((int) e));
83         ans = a + b + c + d + e;
84         System.out.println(ans);
85         total1.setText(Integer.toString((int) ans));
86     }
87 }
88 }
```



The screenshot shows a window titled 'Doughnut Maker' with a green title bar. Inside the window is a table with two columns. The first column lists salary components, and the second column lists their corresponding values. The components are SALARY, HRA, DA, MEDICAL, OTHER, and a total row labeled 'TOTAL' in a blue box.

SALARY	1000
HRA	500
DA	350
MEDICAL	250
OTHER	110
<b>TOTAL</b>	2210

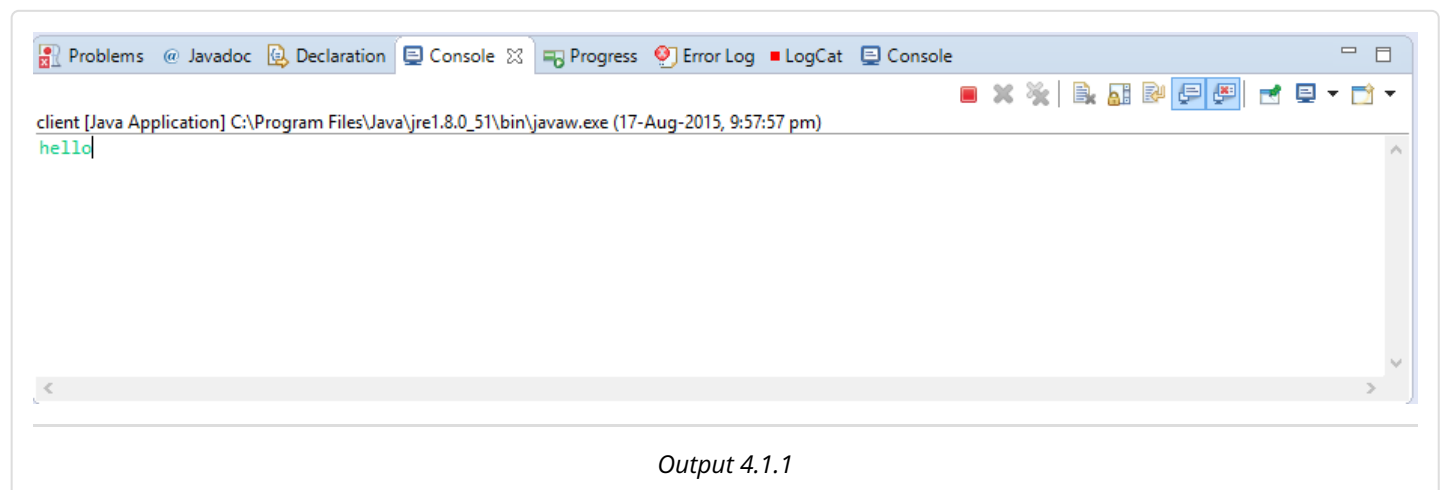
*Output 3.2.1.1*

## 4 Write a program to implement the connection oriented echo client server application

### 4.1 Source of 6\_1.java

```
1 package connection;
2 import java.io.BufferedReader;
3 import java.io.IOException;
4 import java.io.InputStream;
5 import java.io.InputStreamReader;
6 import java.io.OutputStream;
7 import java.net.*;
8
9 public class client {
10
11     Socket s;
12     InputStream is;
13     OutputStream os;
14     BufferedReader br = new BufferedReader(
15         new InputStreamReader(System.in) {
16             @Override
17             public int read() throws IOException {
18                 return 0;
19             }
20         });
21     client() {
22         // TODO Auto-generated constructor stub
23     }
24     try {
25         s = new Socket("127.0.0.1", 1000);
26     } catch(IOException e) {
27         // TODO Auto-generated catch block
28         e.printStackTrace();
29     }
30 }
31
32 void doEcho() throws IOException {
33     int ch = 0;
34
35     try {
36         is = s.getInputStream();
37
38     } catch(IOException e) {
39         // TODO Auto-generated catch block
40         e.printStackTrace();
41     }
42
43     try {
44         os = s.getOutputStream();
45
46     } catch(IOException
47         e) { // TODO Auto-generated catch block
48         e.printStackTrace();
49     }
```

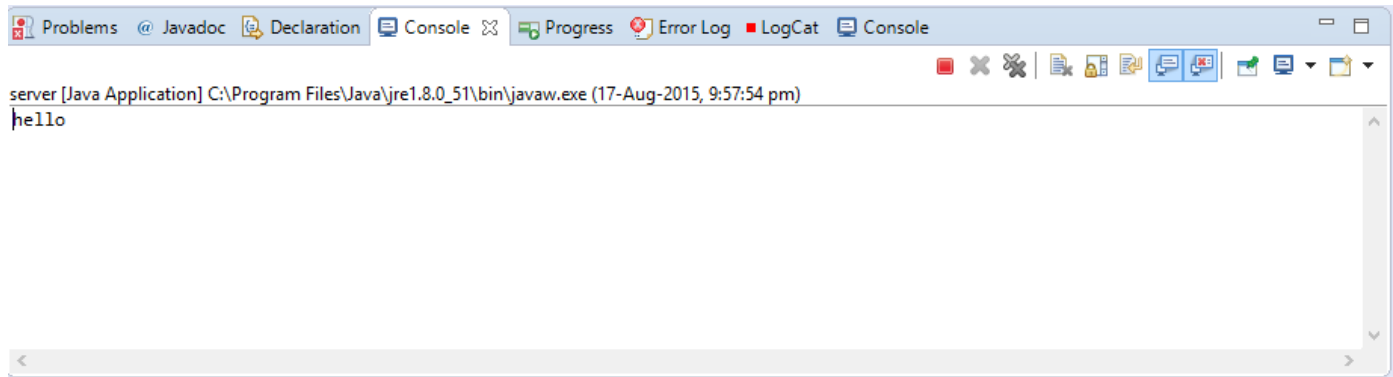
```
50
51     boolean flag = true;
52
53     while(flag) {
54         try {
55             ch = br.read(); //To read users input
56             catch(IOException
57                 e) { // TODO Auto-generated catch block
58                 e.printStackTrace();
59             }
60
61             if(ch == 'x') {
62                 break;
63             }
64
65             try {
66                 os.write(ch); //To write to server's console }
67             catch(IOException
68                 e) { // TODO Auto-generated catch block
69                 e.printStackTrace();
70             }
71
72             try {
73                 is.read(); //To read server's response }
74             catch(IOException
75                 e) { // TODO Auto-generated catch block
76                 e.printStackTrace();
77             }
78         }
79     }
80
81     public static void main(String args[]) throws
82         IOException {
83         client sc = new client();
84         sc.doEcho();
85     }
86 }
```



## 4.2 Source of 6\_2.java

```
1 package connection;
2 import java.io.BufferedReader;
3 import java.io.IOException;
4 import java.io.InputStream;
5 import java.io.InputStreamReader;
6 import java.io.OutputStream;
7 import java.net.*;
8 import java.lang.*;
9 public class server {
10
11     Socket s;
12     ServerSocket ss;
13     InputStream in;
14     OutputStream out;
15
16     BufferedReader br = new BufferedReader(
17     new InputStreamReader(System.in) {
18         @Override
19         public int read() throws
20             IOException {// TODO Auto-generated method stub
21             return 0;
22         }
23     });
24     public server() { // TODO Auto-generated constructor stub
25         try {
26             ss = new ServerSocket(1000);
27
28         } catch(IOException e) {
29             // TODO Auto-generated catch block
30             e.printStackTrace();
31         }
32     }
33     void doEcho() throws IOException {
34         int ch = 0;
35         int t = 0;
36         s = ss.accept();
37         in = s.getInputStream();
38         out = s.getOutputStream();
39
40         while((ch = in.read()) != (-1)) {
41             System.out.print((char)ch);
42             out.write(ch);
43             //System.out.println("");
44         }
45
46         boolean flag = true;
47
48         while(flag) {
49             try {
50                 t = br.read(); //To read users input
51                 catch(IOException
52                     e) { // TODO Auto-generated catch block
53                     e.printStackTrace();
```

```
54         }
55
56         if(t == 'x') {
57             break;
58         }
59
60         try {
61             out.write(t);//TO write to server's console }
62             catch(IOException e) {
63                 // TODO Auto-generated catch block
64                 e.printStackTrace();
65             }
66
67         try {
68             in.read(); //To read server's response }
69             catch(IOException
70                 e) { // TODO Auto-generated catch block
71                 e.printStackTrace();
72             }
73         }
74     }
75
76     public static void main(String args[]) throws
77         IOException {
78         server soc = new server();
79         soc.doEcho();
80     }
81 }
```



Output 4.2.1



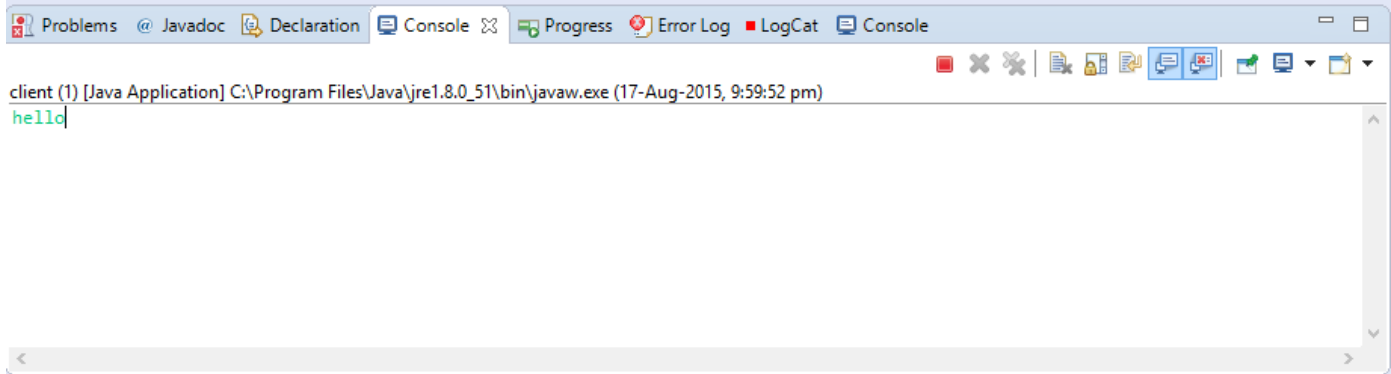
## 5 Write a program to implement the connectionless echo client server application

### 5.1 Source of 7\_1.java

```
1 package connectionless;
2 import java.io.BufferedReader;
3 import java.io.IOException;
4 import java.io.InputStreamReader;
5 import java.net.*;
6
7 public class client {
8     public static void main(String a[]) throws
9         IOException {
10         DatagramSocket ds = new DatagramSocket();
11         byte b[] = null;
12         byte b1[] = null;
13
14         //DatagramSocket ds1=new DatagramSocket();
15         while(true) {
16             b = new byte[1024 * 2];
17             b1 = new byte[1024 * 2];
18             InetAddress ip = InetAddress.getLocalHost();
19             BufferedReader br = new BufferedReader(
20                 new InputStreamReader(System.in));
21             String str = br.readLine();
22             b = str.getBytes();
23             DatagramPacket dp = new DatagramPacket(b,
24                 b.length, ip, 8001);
25             ds.send(dp);
26
27             if(str.toLowerCase().contains("exit")) {
28                 System.out.println("bye...!!!!!!");
29                 break;
30             }
31
32             DatagramPacket dp1 = new DatagramPacket(b1,
33                 b1.length);
34             ds.receive(dp1);
35             String str1 = new String(dp1.getData());
36             System.out.println(str1);
37             //System.out.println(str1.length());
38
39             if(str1.toLowerCase().contains("exit")) {
40                 System.out.println("bye...!!!!!!");
41                 break;
42             }
43         }
44
45         ds.close();
46     }
47 }
```

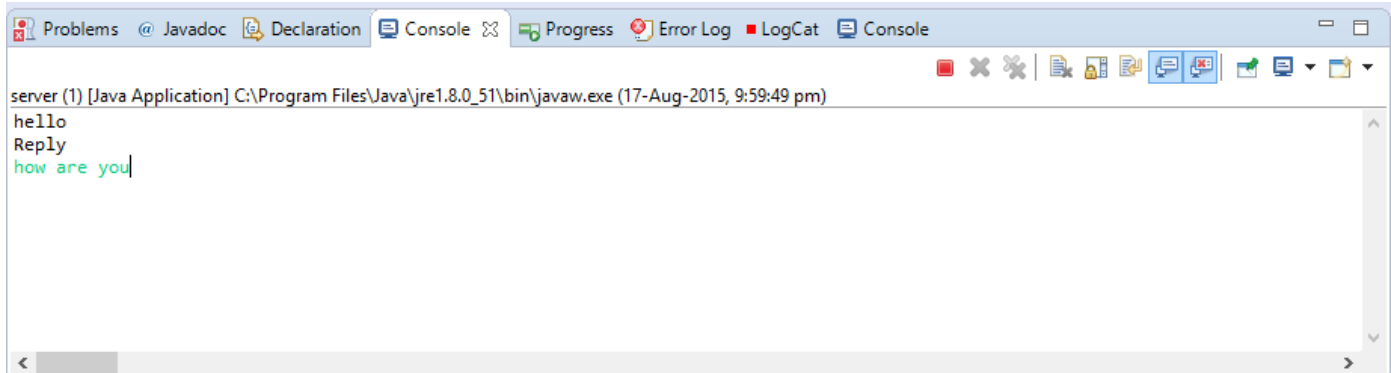
### 5.2 Source of 7\_1.java

```
1 package connectionless;
2 import java.io.BufferedReader;
3 import java.io.IOException;
4 import java.io.InputStreamReader;
5 import java.net.*;
6
7 public class client {
8     public static void main(String a[]) throws
9         IOException {
10         DatagramSocket ds = new DatagramSocket();
11         byte b[] = null;
12         byte b1[] = null;
13
14         //DatagramSocket ds1=new DatagramSocket();
15         while(true) {
16             b = new byte[1024 * 2];
17             b1 = new byte[1024 * 2];
18             InetAddress ip = InetAddress.getLocalHost();
19             BufferedReader br = new BufferedReader(
20                 new InputStreamReader(System.in));
21             String str = br.readLine();
22             b = str.getBytes();
23             DatagramPacket dp = new DatagramPacket(b,
24                 b.length, ip, 8001);
25             ds.send(dp);
26
27             if(str.toLowerCase().contains("exit")) {
28                 System.out.println("bye...!!!!!!");
29                 break;
30             }
31
32             DatagramPacket dp1 = new DatagramPacket(b1,
33                 b1.length);
34             ds.receive(dp1);
35             String str1 = new String(dp1.getData());
36             System.out.println(str1);
37             //System.out.println(str1.length());
38
39             if(str1.toLowerCase().contains("exit")) {
40                 System.out.println("bye...!!!!!!");
41                 break;
42             }
43         }
44
45         ds.close();
46     }
47 }
```



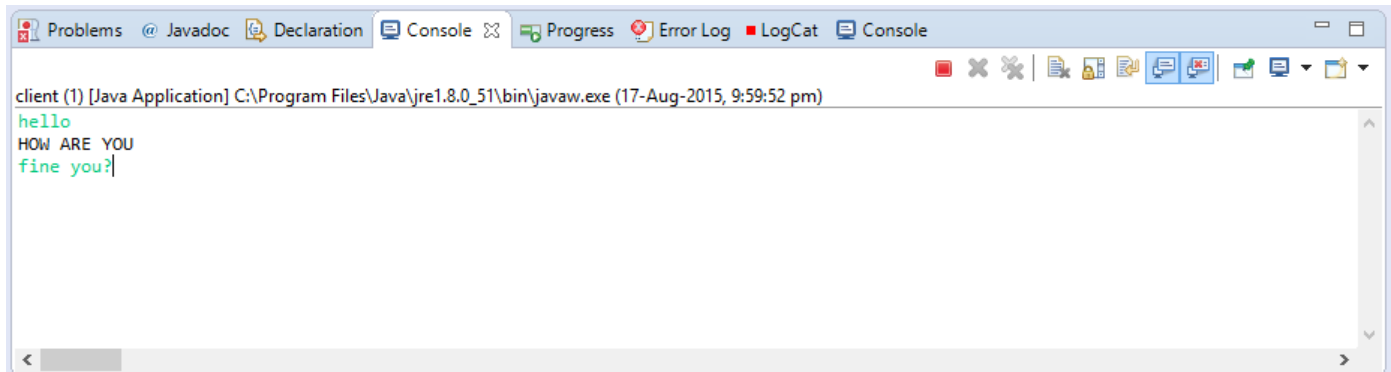
The screenshot shows a Java IDE console window with the following tabs: Problems, Javadoc, Declaration, Console, Progress, Error Log, LogCat, and Console. The console output is as follows:

```
client (1) [Java Application] C:\Program Files\Java\jre1.8.0_51\bin\javaw.exe (17-Aug-2015, 9:59:52 pm)
hello
```

*Output 5.2.1*

The screenshot shows a Java IDE console window with the following tabs: Problems, Javadoc, Declaration, Console, Progress, Error Log, LogCat, and Console. The console output is as follows:

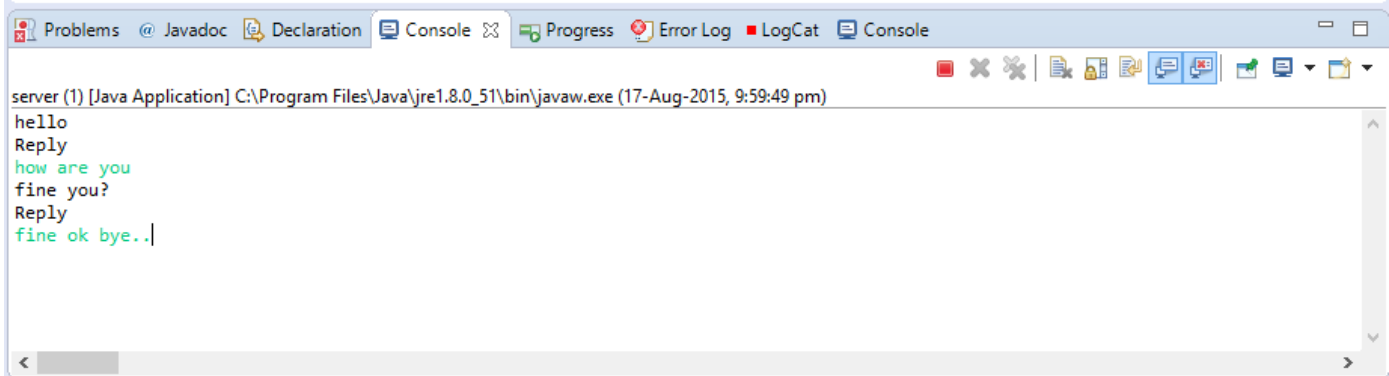
```
server (1) [Java Application] C:\Program Files\Java\jre1.8.0_51\bin\javaw.exe (17-Aug-2015, 9:59:49 pm)
hello
Reply
how are you
```

*Output 5.2.2*

The screenshot shows a Java IDE console window with the following tabs: Problems, Javadoc, Declaration, Console, Progress, Error Log, LogCat, and Console. The console output is as follows:

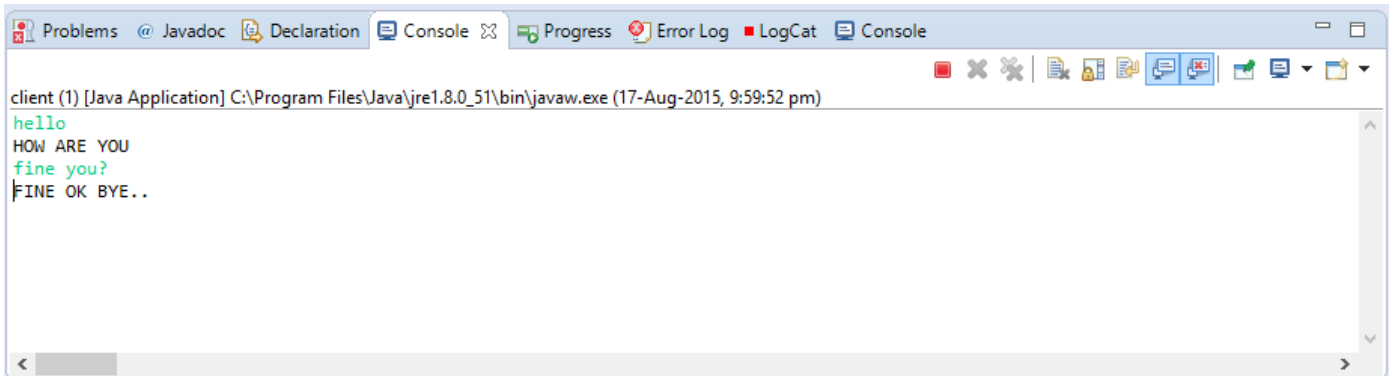
```
client (1) [Java Application] C:\Program Files\Java\jre1.8.0_51\bin\javaw.exe (17-Aug-2015, 9:59:52 pm)
hello
HOW ARE YOU
fine you?
```

*Output 5.2.3*



The screenshot shows an IDE console window with the following tabs: Problems, Javadoc, Declaration, Console, Progress, Error Log, LogCat, and Console. The console output is as follows:

```
server (1) [Java Application] C:\Program Files\Java\jre1.8.0_51\bin\javaw.exe (17-Aug-2015, 9:59:49 pm)
hello
Reply
how are you
fine you?
Reply
fine ok bye..|
```

*Output 5.2.4*

The screenshot shows an IDE console window with the following tabs: Problems, Javadoc, Declaration, Console, Progress, Error Log, LogCat, and Console. The console output is as follows:

```
client (1) [Java Application] C:\Program Files\Java\jre1.8.0_51\bin\javaw.exe (17-Aug-2015, 9:59:52 pm)
hello
HOW ARE YOU
fine you?
FINE OK BYE..
```

*Output 5.2.5*

## 6 Remote Method Invocation Programs

6.1 Write a java RMI application which implements the simple arithmetic operations like add, multiply, subtract and divide. The client program sends two number and the arithmetic operation that wants to perform. The server performs the operation and sends back the result to the client

### 6.1.1 Source of 8a1.java

```
1 package rmi1;  
2  
3 import java.rmi.Remote;  
4 import java.rmi.RemoteException;  
5 public interface Calculator extends Remote {  
6     public long add(long a,  
7                     long b) throws RemoteException;  
8     public long sub(long a,  
9                     long b) throws RemoteException;  
10    public long mul(long a,  
11                    long b) throws RemoteException;  
12    public long div(long a,  
13                    long b) throws RemoteException;  
14 }
```

### 6.1.2 Source of 8a2.java

```
1 package rmi1;  
2 import java.rmi.RemoteException;  
3 import java.rmi.server.UnicastRemoteObject;  
4 public class CalculatorImpl extends  
5     UnicastRemoteObject implements Calculator {  
6  
7     public CalculatorImpl() throws RemoteException {  
8         super();  
9     }  
10    public long add(long a,  
11                    long b) throws RemoteException {  
12        return a + b;  
13    }  
14    public long sub(long a,  
15                    long b) throws RemoteException {  
16        return a - b;  
17    }  
18    public long mul(long a,  
19                    long b) throws RemoteException {  
20        return a * b;  
21    }  
22    public long div(long a,  
23                    long b) throws RemoteException {  
24        try {  
25            return a / b;  
26        } catch (Exception e) {  
27
```

```
28         System.out.println(e);
29     return (-1);
30 }
31 }
32 }
```

### 6.1.3 Source of 8a3.java

```
1 package rmi1;
2 import java.rmi.Naming;
3 public class CalculatorServer {
4     CalculatorServer() {
5         try {
6             Calculator c = new CalculatorImpl();
7             Naming.rebind("rmi://127.0.0.1:1099/CalculatorService",
8                 c);
9         } catch (Exception e) {
10             e.printStackTrace();
11         }
12     }
13 }
14 public static void main(String[] args) {
15     new CalculatorServer();
16 }
17 }
```

### 6.1.4 Source of 8a4.java

```
1 package rmi1;
2
3 import java.rmi.Naming;
4 public class CalculatorClient {
5     public static void main(String[] args) {
6         try {
7             Calculator c = (Calculator)
8                 Naming.lookup("//127.0.0.1:1099/CalculatorService");
9             System.out.println("addition : " + c.add(10, 15));
10            System.out.println("subtraction : " + c.sub(10,
11                15));
12            System.out.println("multiplication : " + c.mul(10,
13                15));
14            System.out.println("division : " + c.div(25, 5));
15
16        } catch (Exception e) {
17            System.out.println(e);
18        }
19    }
20 }
```

```
addition : 25  
subtraction : -5  
multiplication : 150  
division : 5
```

---

*Output 6.1.4.1*

**6.2** Write an RMI application where client supplies the string arguments and server responds the number of character, number of words and number of digits in given string.

**6.2.1** Source of 8b1.java

```
1 public interface WordsInterface extends
2     java.rmi.Remote {
3     int countChar(String s) throws
4         java.rmi.RemoteException;
5     int countWords(String s) throws
6         java.rmi.RemoteException;
7     int countDigits(String s) throws
8         java.rmi.RemoteException;
9 }
```

**6.2.2** Source of 8b2.java

```
1 import java.rmi.Naming;
2 import java.rmi.RemoteException;
3 import java.rmi.server.UnicastRemoteObject;
4 import java.util.StringTokenizer;
5
6 public class WordsImpl extends UnicastRemoteObject
7     implements WordsInterface {
8     int totalCharacters = 0;
9     int count = 0;
10    int totalWords = 0;
11    public WordsImpl(String name) throws
12        RemoteException {
13        super();
14
15        try {
16            Naming.rebind(name, this);
17
18        } catch (Exception e) { }
19    }
20    @Override
21    public int countChar(String s) throws
22        RemoteException {
23        StringTokenizer tokens = new StringTokenizer(s,
24            " ");
25
26        while(tokens.hasMoreTokens()) {
27            String token = tokens.nextToken();
28
29            for(int i = 0; i < s.length(); i++) {
30                if(Character.isDigit(s.charAt(i))) {
31                    count++;
32
33                } else {
34                    totalCharacters++;
35                }
36            }
37        }
38    }
```



```

36         }
37
38         totalWords++;
39     }
40
41     return totalCharacters;
42 }
43 @Override
44 public int countWords(String s) throws
45     RemoteException {
46     return totalWords;
47 }
48 @Override
49 public int countDigits(String s) throws
50     RemoteException {
51     return count;
52 }
53 }

```

### 6.2.3 Source of 8b3.java

```

1 import java.rmi.*;
2 import java.rmi.registry.*;
3 import java.rmi.server.*;
4 public class WordsServer {
5     public static void main(String args[]) {
6         System.setSecurityManager(new
7             RMISecurityManager());
8
9         try {
10             WordsImpl pim = new WordsImpl("//localhost/pno");
11             System.out.println("\nServer is ready...");
12
13         } catch (Exception e) { }
14     }
15 }

```

### 6.2.4 Source of 8b4.java

```

1 import java.rmi.*;
2 import java.rmi.registry.*;
3 import java.rmi.server.*;
4 import java.io.DataInputStream;
5 public class WordsClient {
6     public static void main(String args[]) {
7         System.setSecurityManager(new
8             RMISecurityManager());
9
10        try {
11            int chars, words, digits;
12            String s;
13            WordsInterface pi = (WordsInterface)

```

```

14 Naming.lookup("//localhost/pno");
15 DataInputStream in = new DataInputStream(
16     System.in);;
17 System.out.print("Enter String and press Y to stop ");
18 char ch;
19 int i = 0;
20 s = in.readLine();
21 chars = pi.countChar(s);
22 System.out.println("characters are :" + chars);
23 digits = pi.countDigits(s);
24 System.out.println("digits are :" + digits);
25 words = pi.countWords(s);
26 System.out.println("characters are :" + words);
27
28 } catch(Exception e) { }
29 }
30 }

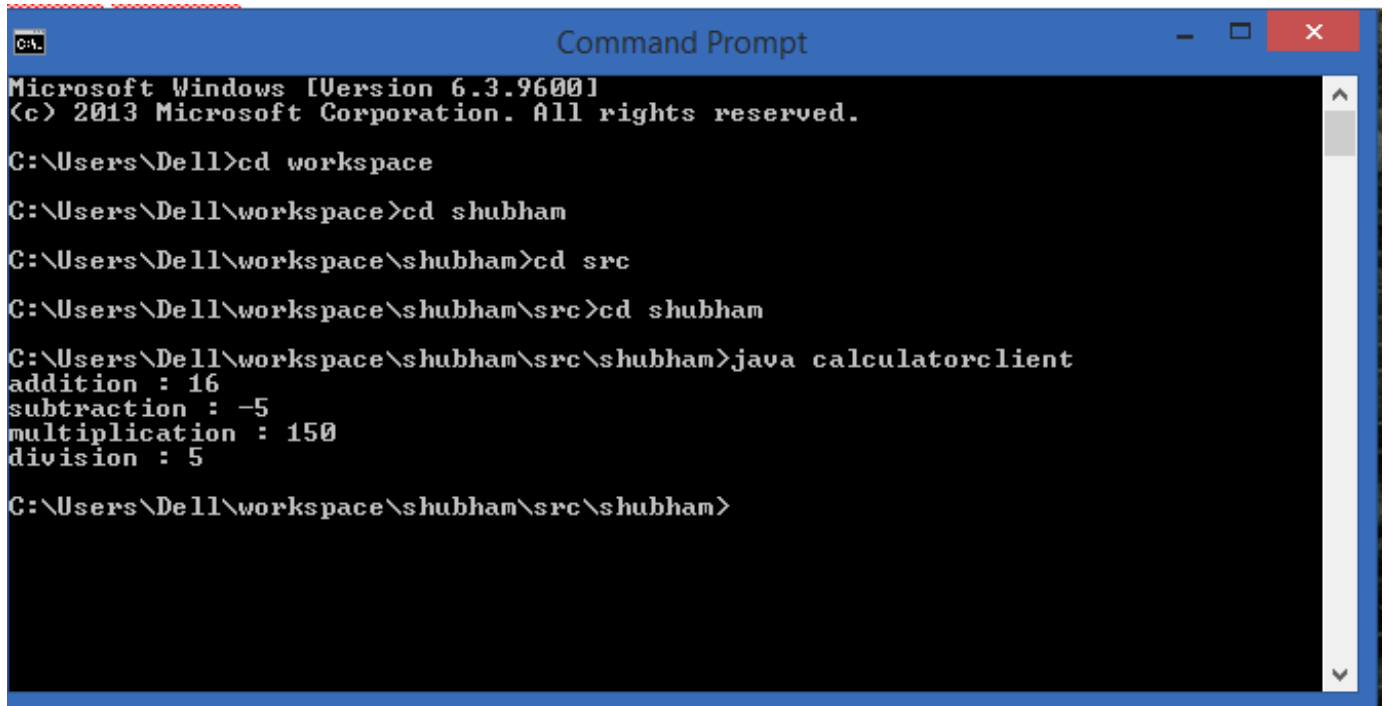
```

```

C:\Users\Dell>start rmiregistry
C:\Users\Dell>cd workspace
C:\Users\Dell\workspace>cd shubham
C:\Users\Dell\workspace\shubham>cd src
C:\Users\Dell\workspace\shubham\src>cd shubham
C:\Users\Dell\workspace\shubham\src\shubham>javac *.java
C:\Users\Dell\workspace\shubham\src\shubham>rmic calculatorimpl
Warning: generation and use of skeletons and static stubs for JRMP
is deprecated. Skeletons are unnecessary, and static stubs have
been superseded by dynamically generated stubs. Users are
encouraged to migrate away from using rmic to generate skeletons and static
stubs. See the documentation for java.rmi.server.UnicastRemoteObject.
C:\Users\Dell\workspace\shubham\src\shubham>java calculatorserver

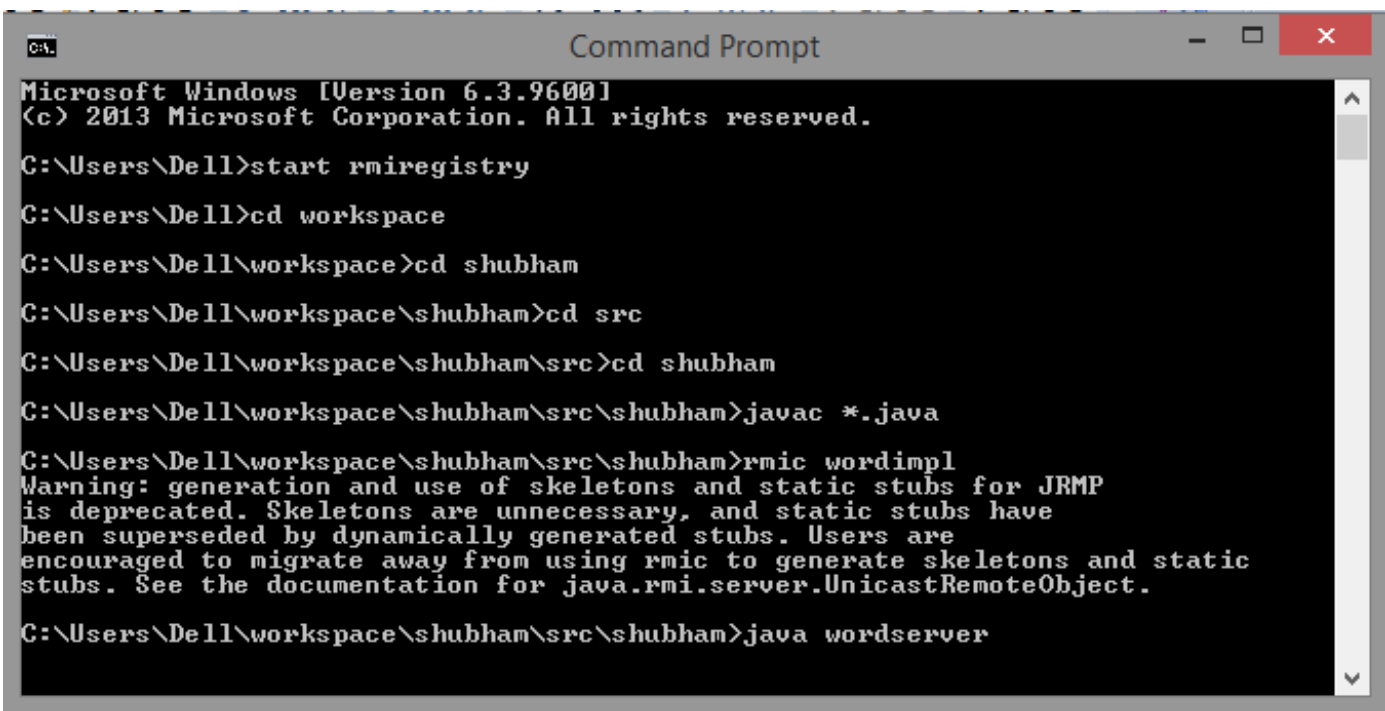
```

Output 6.2.4.1



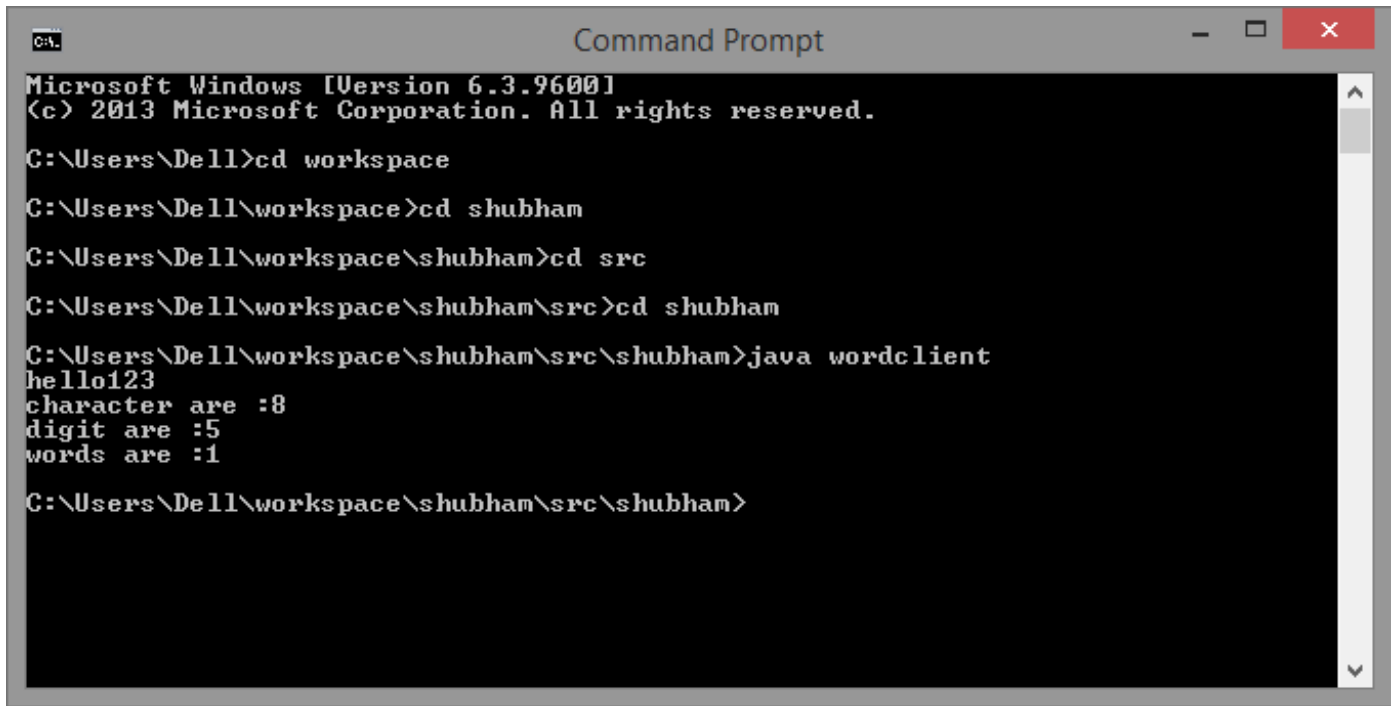
```
C:\Users\Dell>cd workspace
C:\Users\Dell\workspace>cd shubham
C:\Users\Dell\workspace\shubham>cd src
C:\Users\Dell\workspace\shubham\src>cd shubham
C:\Users\Dell\workspace\shubham\src\shubham>java calculatorclient
addition : 16
subtraction : -5
multiplication : 150
division : 5
C:\Users\Dell\workspace\shubham\src\shubham>
```

Output 6.2.4.2



```
C:\Users\Dell>start rmiregistry
C:\Users\Dell>cd workspace
C:\Users\Dell\workspace>cd shubham
C:\Users\Dell\workspace\shubham>cd src
C:\Users\Dell\workspace\shubham\src>cd shubham
C:\Users\Dell\workspace\shubham\src\shubham>javac *.java
C:\Users\Dell\workspace\shubham\src\shubham>rmic wordimpl
Warning: generation and use of skeletons and static stubs for JRMP
is deprecated. Skeletons are unnecessary, and static stubs have
been superseded by dynamically generated stubs. Users are
encouraged to migrate away from using rmic to generate skeletons and static
stubs. See the documentation for java.rmi.server.UnicastRemoteObject.
C:\Users\Dell\workspace\shubham\src\shubham>java wordserver
```

Output 6.2.4.3



```
Command Prompt
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. All rights reserved.

C:\Users\Dell>cd workspace
C:\Users\Dell\workspace>cd shubham
C:\Users\Dell\workspace\shubham>cd src
C:\Users\Dell\workspace\shubham\src>cd shubham
C:\Users\Dell\workspace\shubham\src\shubham>java wordclient
hello123
character are :8
digit are :5
words are :1
C:\Users\Dell\workspace\shubham\src\shubham>
```

Output 6.2.4.4