LAB : 3

OBJECTIVE :

Create an application which

1. draws basic graphical primitives on the screen.

2. draws a bar graph to display. Data values can be given at int[]array.

3. examines a phone number, that a user entered in a given format. *Area code should be one of the following: 040, 041, 050, and 0400,044

Requrements :

(a) Windows PC (Windows 7/8/10) / Mac

(b) JDK 1.5

(c) Java Wireless Toolkit 2.5.2

Implementation :

a) Draws basic graphical primitives on the screen

GraphicsPremitives.java :

```
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;
import javax.microedition.io.*;

import java.io.* ;
import java.lang.*;

public class GraphicsPremitives extends MIDlet implements CommandListener {
```

```
    Display display;
    Form form;
    List menu;
    Ticker ticker;
    static final Command backCommand = new Command("Back", Command.BACK, 0);
    static final Command exitCommand = new Command("Exit", Command.STOP, 1);
    String currentlyAt;

    public GraphicsPremitives() {
        super();
    }

    public void startApp() throws MIDletStateChangeException {
        display = Display.getDisplay(this);
        menu = new List("LAB 3", Choice.IMPLICIT);
        menu.append("1. Line", null);
        menu.append("2. Rectangle", null);
        menu.append("3. Rounded Rectangle", null);
        menu.append("4. Circle", null);
        menu.append("5. Ellipse", null);
        menu.append("6. Arc", null);
        menu.append("7. Triangle", null);
        menu.addCommand(exitCommand);
        menu.setCommandListener(this);
        ticker = new Ticker("18124004 : Lab 3 - Graphics Premitives");
        menu.setTicker(ticker);
        mainMenu();
    }

    void mainMenu() {
        display.setCurrent(menu);
```

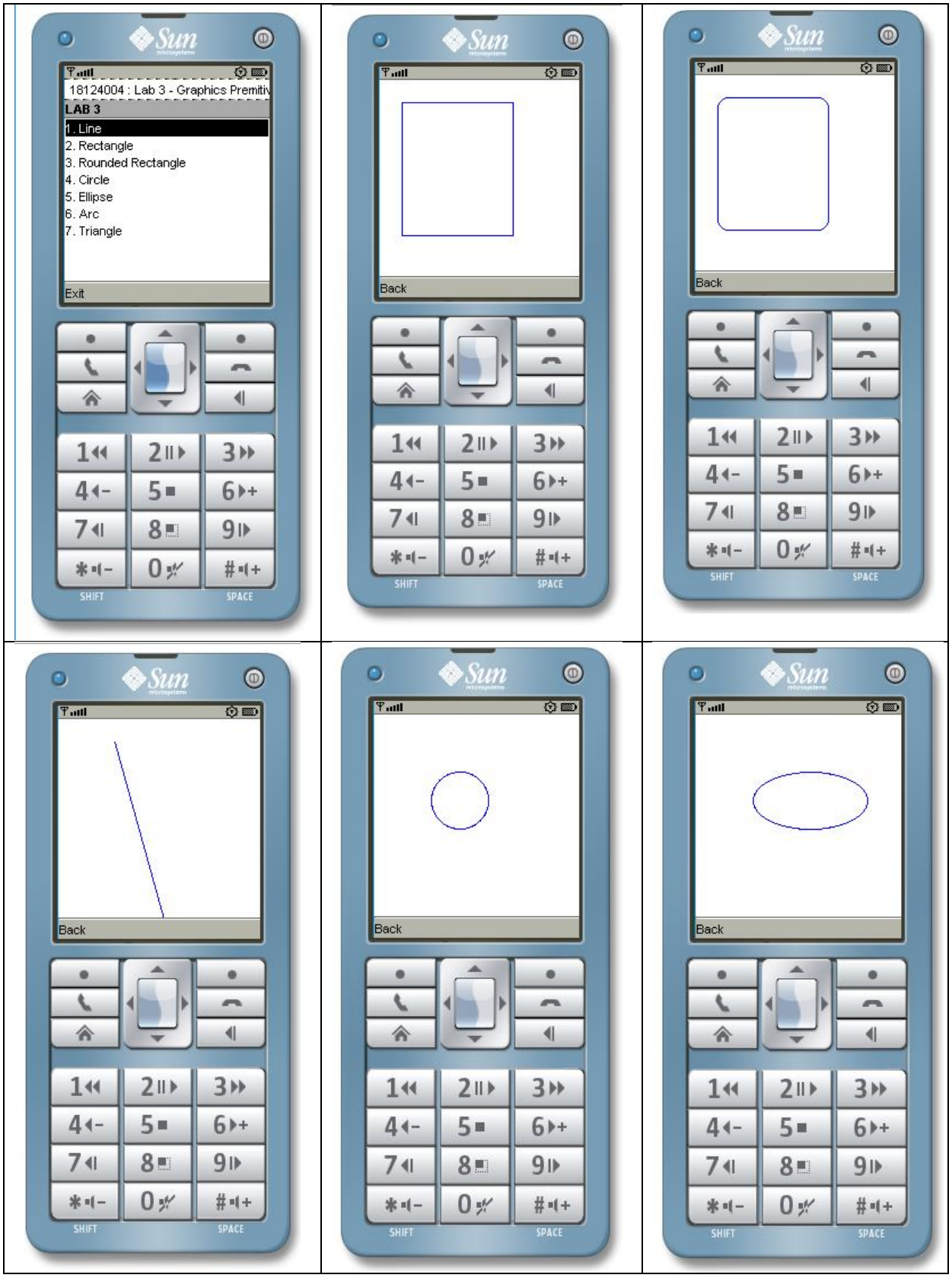
```
        currentlyAt = "main";
    }

    public void pauseApp() {
        display = null;
        form = null;
        ticker = null;
        menu = null;
        currentlyAt = null;
    }

    public void destroyApp(boolean unconditional) {
        notifyDestroyed();
    }

    public void commandAction(Command cm, Displayable ds) {
        String label = cm.getLabel();
        if (label.equals("Exit")) {
            destroyApp(true);
        } else if (label.equals("Back")) {
            mainMenu();
        } else {
            List down = (List)display.getCurrent();
            switch (down.getSelectedIndex()) {
            case 0: drawLine(); break;
            case 1: drawRect(); break;
            case 2: drawRoundRect(); break;
            case 3: drawCirc(); break;
            case 4: drawOval(); break;
            case 5: drawArc(); break;
            case 6: drawTri(); break;
```

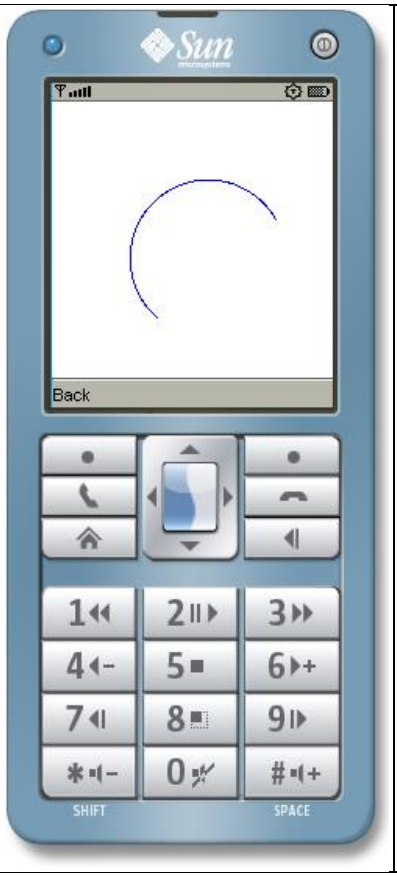
```
        }
      }
    }

    public void drawLine() {
      graphicsCanvas c = new graphicsCanvas(0);
      c.addCommand(backCommand);
      c.setCommandListener(this);
      display.setCurrent(c);
      currentlyAt = "Line";
    }

    public void drawRect() {
      graphicsCanvas c = new graphicsCanvas(1);
      c.addCommand(backCommand);
      c.setCommandListener(this);
      display.setCurrent(c);
      currentlyAt = "Rectangle";
    }

    public void drawRoundRect() {
      graphicsCanvas c = new graphicsCanvas(2);
      c.addCommand(backCommand);
      c.setCommandListener(this);
      display.setCurrent(c);
      currentlyAt = "RoundedRect";
    }

    public void drawCirc() {
      graphicsCanvas c = new graphicsCanvas(3);
      c.addCommand(backCommand);
```

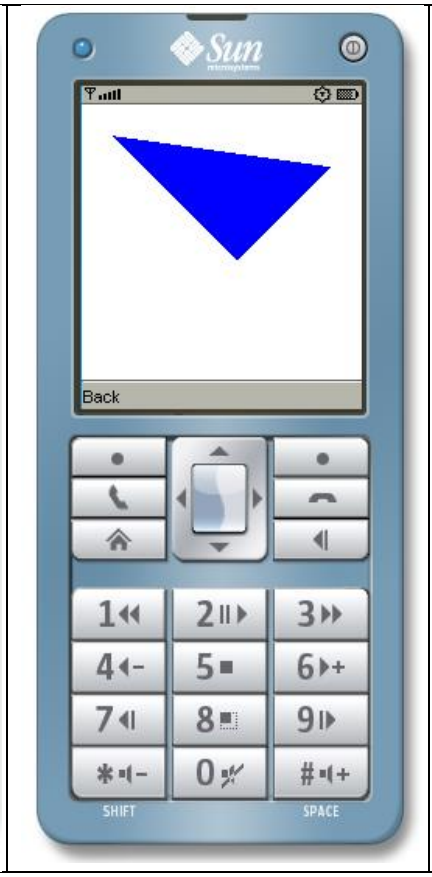
```
        c.setCommandListener(this);
        display.setCurrent(c);
        currentlyAt = "Circle";
    }

    public void drawOval() {
        graphicsCanvas c = new graphicsCanvas(4);
        c.addCommand(backCommand);
        c.setCommandListener(this);
        display.setCurrent(c);
        currentlyAt = "Oval";
    }

    public void drawArc() {
        graphicsCanvas c = new graphicsCanvas(5);
        c.addCommand(backCommand);
        c.setCommandListener(this);
        display.setCurrent(c);
        currentlyAt = "Arc";
    }

    public void drawTri() {
        graphicsCanvas c = new graphicsCanvas(6);
        c.addCommand(backCommand);
        c.setCommandListener(this);
        display.setCurrent(c);
        currentlyAt = "Triangle";
    }
}

class graphicsCanvas extends Canvas {
```

```
    int choice;
    public graphicsCanvas (int i) {
        super();
        choice = i;
    }
    public void paint(Graphics g) {
        g.setColor(0xffffff);
        g.fillRect(0, 0, getWidth(), getHeight());
        g.setColor(0x0000ff);
        if (choice == 0) { //line
            g.drawLine(50, 20, 100, 200);
        } else if (choice == 1) { //rectangle
            g.drawRect(20, 20, 100, 120);
        } else if (choice == 2) { //rounded rectangle
            g.drawRoundRect(20, 20, 100, 120, 20, 20);
        } else if (choice == 3) { //circle
            g.drawArc(50, 50, 50, 50, 0, 360);
        } else if (choice == 4) { //ellipse
            g.drawArc(50, 50, 100, 50, 0, 360);
        } else if (choice == 5) { //arc
            g.drawArc(50, 50, 100, 100, 30, 200);
        } else if (choice == 6) { //triangle
            g.fillTriangle(20, 20, 160, 40, 120, 20);
        } else {
            g.setFont(Font.getFont(Font.FACE_SYSTEM, Font.STYLE_BOLD, Font.SIZE_MEDIUM));
            g.drawString("ERROR: UNIDENTIFIED SHAPE CHOICE", 0, 30, g.LEFT | g.TOP);
        }
    }
}
```

Output :


18124004 : Lab 3 - Graphics Premitiv
LAB 3
1. Line
2. Rectangle
3. Rounded Rectangle
4. Circle
5. Ellipse
6. Arc
7. Triangle
Exit
Back
Back
Back
Back
Back
SHIFT
SPACE


Sun
Back
1
2
3
4
5
6
7
8
9
*
0
#
SHIFT
SPACE


Sun
Back
1
2
3
4
5
6
7
8
9
*
0
#
SHIFT
SPACE

b) draws a bar graph to display. Data values can be given at int[]array.

PhoneNumberValidation.java :

```
import javax.microedition.midlet.*;
import javax.microedition.lcdui.*;

public class PhoneNumberValidation extends MIDlet implements CommandListener {

    public Form form;
    public TextField textfield;
    public Command exitCommand;
    public Command okCommand;
    public StringItem st;
    public String instruction;
    public Display display;

    public PhoneNumberValidation() {

            display = Display.getDisplay(this);
            form = new Form("Insert the Phone number");

            exitCommand = new Command("Exit", Command.EXIT, 1);
            okCommand = new Command("Ok", Command.OK, 1);
            st = new StringItem("Phone Number is ", "");
            instruction = "Format : <areaCode>XXXXXX\nArea code must be
040|050|041|0400|044\n";

            textfield = new TextField("Phone Number:", "", 30, TextField.ANY);


            form.append(textfield);
            form.append(instruction);
            form.addCommand(okCommand);
            form.addCommand(exitCommand);
            form.setCommandListener(this);

    }

    public void startApp() { display.setCurrent(form); }

    public void pauseApp() { }

    public void destroyApp(boolean unconditional) { }
```

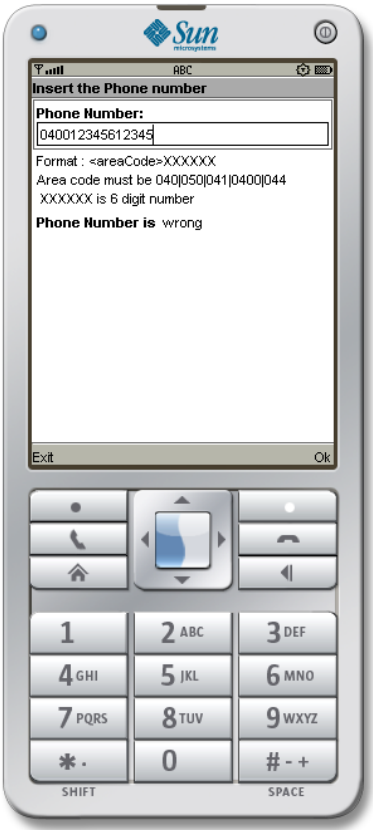
```
    public void commandAction(Command cmd, Displayable displayable)    {
            if (cmd == exitCommand) {
                    notifyDestroyed();
            } else if (cmd == okCommand) {
                    String s = textfield.getString();
                    boolean correct = false;
                    int len = s.length();

                    if (len == 9 || len == 10) {
                            String number = s.substring(len - 6);
                            String areaCode = s.substring(0, len - 6);
                            boolean numberIsNumeric = true;

                            try {
                                    int num = Integer.parseInt(number);
                            } catch (NumberFormatException e) {
                                    numberIsNumeric = false;
                            }

                            if (areaCode.equals("040") || areaCode.equals("041") ||
areaCode.equals("050") || areaCode.equals("0400") || areaCode.equals("044")) {
                                    if (number.length() == 6 && numberIsNumeric ) {
                                            correct = true;
                                    }
                            }
                    }


                    if (correct)  {
                            st.setText("OK");
                    } else {
                            st.setText("wrong\n");
                    }

                    form.append(st);

            }
    }
}
```

Output :


Insert the Phone number
Phone Number:
040456
Format : <areaCode>XXXXXX
Area code must be 040|050|041|0400|044
XXXXXX is 6 digit number
Phone Number is wrong
Exit
Ok


Insert the Phone number
Phone Number:
040456124
Format : <areaCode>XXXXXX
Area code must be 040|050|041|0400|044
XXXXXX is 6 digit number
Phone Number is OK
Exit
Ok


Insert the Phone number
Phone Number:
0400123456
Format : <areaCode>XXXXXX
Area code must be 040|050|041|0400|044
XXXXXX is 6 digit number
Phone Number is OK
Exit
Ok


Insert the Phone number
Phone Number:
040012345612345
Format : <areaCode>XXXXXX
Area code must be 040|050|041|0400|044
XXXXXX is 6 digit number
Phone Number is wrong
Exit
Ok

c) examines a phone number, that a user entered in a given format. *Area code should be one of the following: 040, 041, 050, and 0400,044

BarGraph.java :

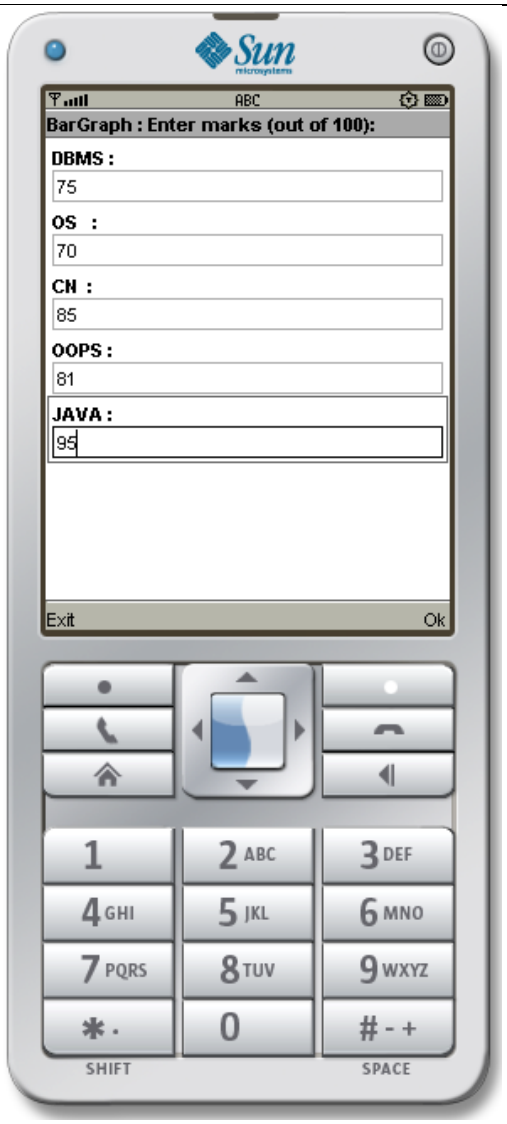
```
import javax.microedition.midlet.*;
import javax.microedition.lcdui.*;
public class BarGraph extends MIDlet implements CommandListener {
        public Form form;
        public Command exitCommand;
        public Command OkCommand;
        public Command backCommand;
        public Displayable d;
        public Display display;
        public TextField []textfield;
        public static int []color = {0x00CED1, 0xff0033, 0x0a75ad, 0xffb6c1, 0xee8899};
        public static String []labels = {"DBMS :", "OS   :", "CN            :", "OOPS :", "JAVA :"};


        public BarGraph() {
                display = Display.getDisplay(this);
                form = new Form("BarGraph : Enter marks (out of 100):");

                textfield = new TextField[5];
                for (int i = 0; i < 5 ; ++i ) {
                        textfield[i] = new TextField(labels[i], "", 30, TextField.ANY);
                        form.append(textfield[i]);

                }

                OkCommand = new Command("Ok", Command.OK, 1);
                exitCommand = new Command("Exit", Command.EXIT, 1);
```

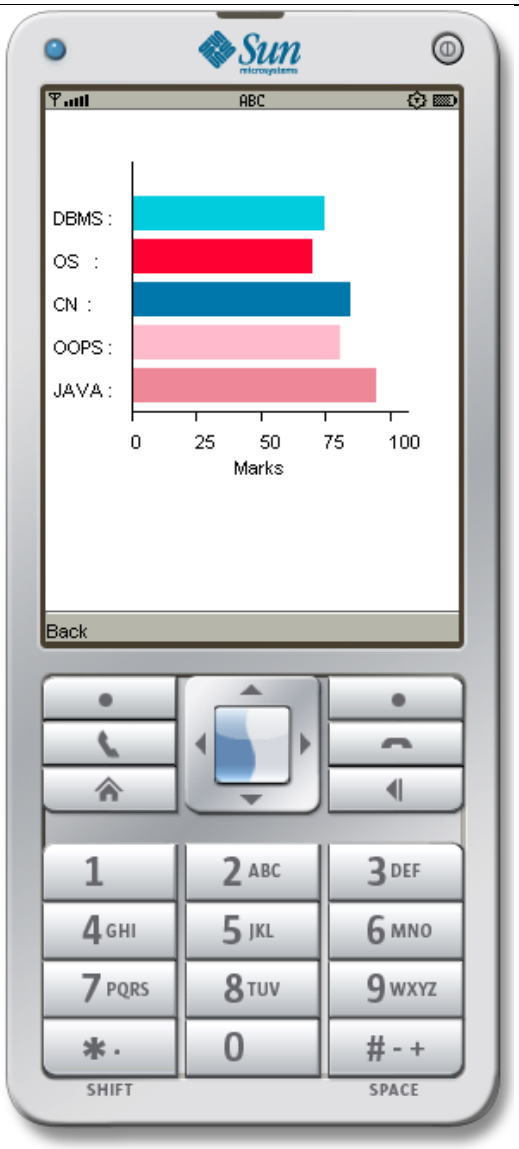
```
            backCommand = new Command("Back", Command.BACK, 1);
            form.addCommand(OkCommand);
            form.addCommand(exitCommand);
            form.setCommandListener(this);
    }

    public void startApp() { display.setCurrent(form); }

    public void pauseApp() { }

    public void destroyApp(boolean unconditional) { }

    public void commandAction(Command command, Displayable displayable) {
            if (displayable == form) {
                    if (command == OkCommand) {
                            int[] data = new int[5];

                            for (int i = 0; i < 5 ; ++i ) {
                                    data[i] = Integer.parseInt(textfield[i].getString());
                            }

                            d = new BarCanvas(data);
                            d.addCommand(backCommand);
                            d.setCommandListener(this);
                            display.setCurrent(d);
                    } else if (command == exitCommand) {
                            notifyDestroyed();
                    }
            } else if (displayable == d) {
                    if (command == backCommand) {
                            display.setCurrent(form);
```

```
                }
        }
}

class BarCanvas extends Canvas {
        int[] data;
        int height = 20;
        int width = 0;
        int ox = 50, oy = 50;
        int px = 5,  py = 55;
        int inc = 25;
        int maxWidth = 150;
        int maxMarks = 100;

        public BarCanvas() {}
        public BarCanvas(int[] data) {
                this.data = data;
        }

        public void paint(Graphics g) {
                g.setColor(255, 255, 255);
                g.fillRect(0, 0, this.getWidth(), this.getHeight());

                int i = 0;
                while (i < data.length) {

                        //find horizontal lenght
                        width = (int)data[i] * maxWidth / maxMarks;

                        //draw bar
                        g.setColor(color[i]);
```

```
                    g.fillRect(ox, oy, width, height);

                    //print label
                    g.setColor(0, 0, 0);
                    g.drawString(labels[i], px, py, g.TOP | g.LEFT);

                    //next element
                    oy += inc;
                    py += inc;
                    i++;
                }

                //draw lines
                g.setColor(0, 0, 0);
                g.drawLine(ox, 30, ox, oy);
                g.drawLine(ox, oy, ox + 160, oy);

                //plot markings
                int cur = 0;
                while (cur <= 100) {
                    int newX = (int)(cur * maxWidth / maxMarks) + ox;
                    g.drawLine(newX, oy, newX, oy + 5);
                    g.drawString("" + cur, newX, oy + 10, g.TOP | g.LEFT);
                    cur += 25;
                }
                g.drawString("Marks", ox + 60, oy + 25, g.TOP | g.LEFT);            }
        }
}
```

Output :


Sun
ABC
BarGraph : Enter marks (out of 100):
DBMS :
75
OS :
70
CN :
85
OOPS :
81
JAVA :
95
Exit
Ok
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
* .
0
- +
SHIFT
SPACE


Sun
ABC
DBMS :
OS :
CN :
OOPS :
JAVA :
0
25
50
75
100
Marks
Back
1
2 ABC
3 DEF
4 GHI
5 JKL
6 MNO
7 PQRS
8 TUV
9 WXYZ
* .
0
- +
SHIFT
SPACE