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Mobile Application Development Lab

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File Submission Date-19/05/2022

Index

LAB 1

Install any relevant software such as Java Wireless Toolkit(J2ME) or Android Studio todevelop mobile applications

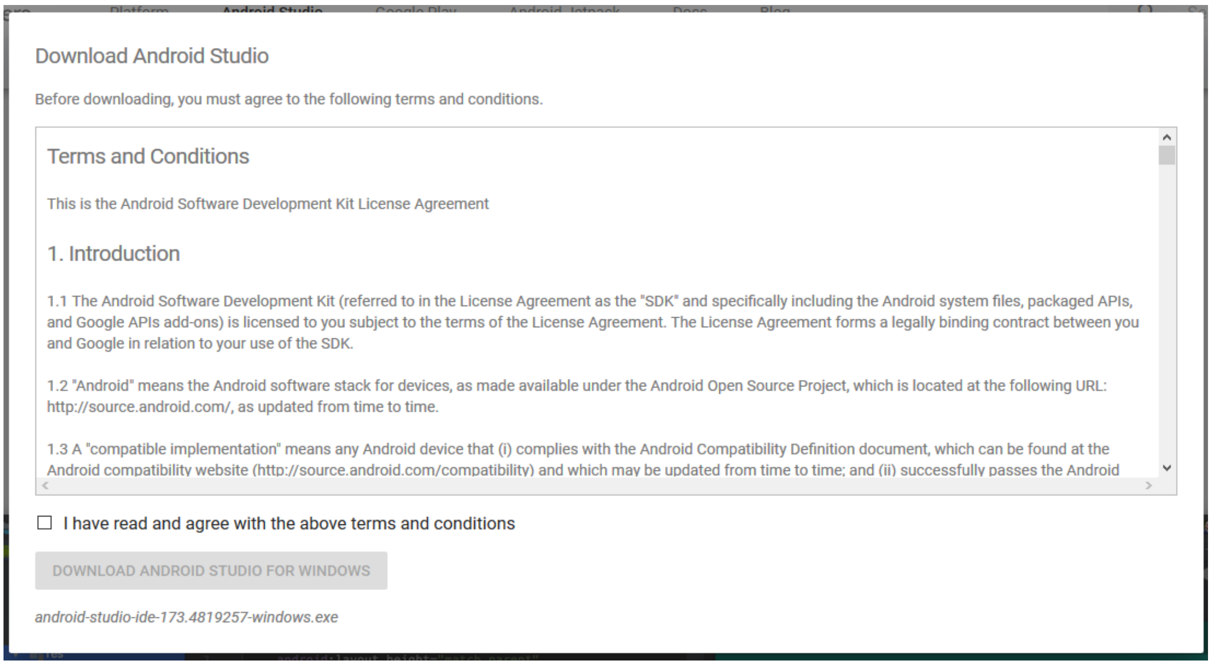
Android Studio

Installation steps:

1: Download the Android Studio executable or zip file from android site.

2: Click on the Download Android Studio Button.

Click on the checkbox "I have read and agree".



Download Android Studio

Before downloading, you must agree to the following terms and conditions.

Terms and Conditions

This is the Android Software Development Kit License Agreement

1. Introduction

1.1 The Android Software Development Kit (referred to in the License Agreement as the "SDK" and specifically including the Android system files, packaged APIs, and Google APIs add-ons) is licensed to you subject to the terms of the License Agreement. The License Agreement forms a legally binding contract between you and Google in relation to your use of the SDK.

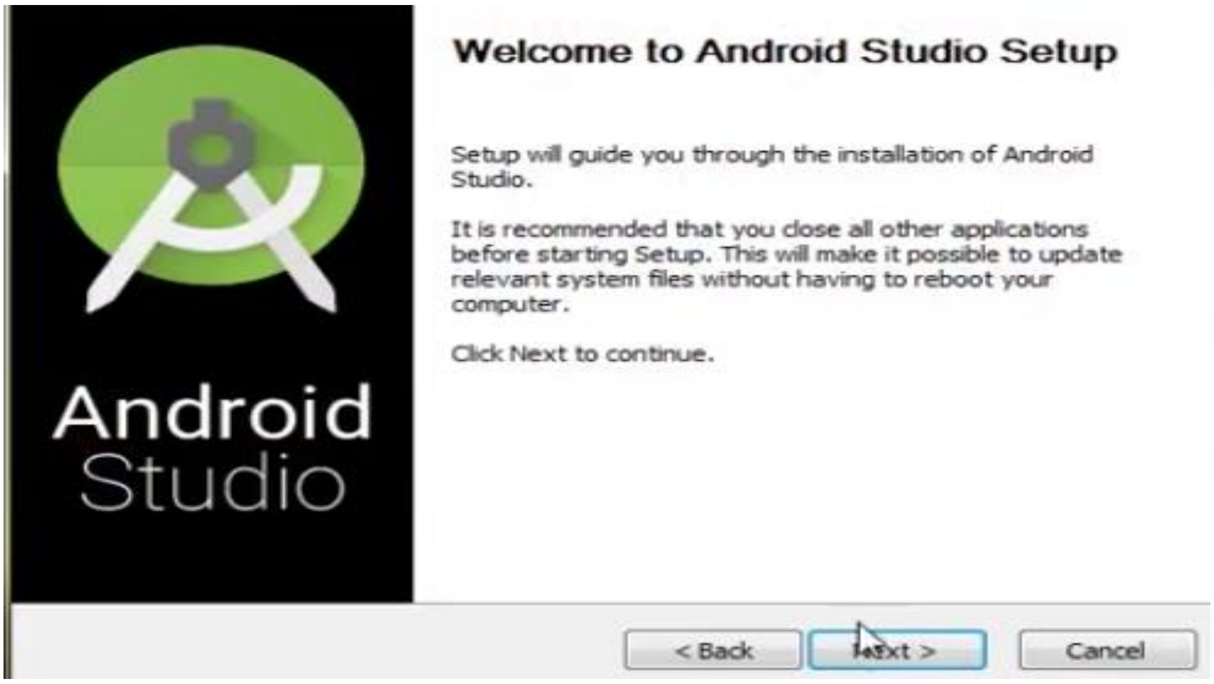
1.2 "Android" means the Android software stack for devices, as made available under the Android Open Source Project, which is located at the following URL: http://source.android.com/, as updated from time to time.

1.3 A "compatible implementation" means any Android device that (i) complies with the Android Compatibility Definition document, which can be found at the Android compatibility website (http://source.android.com/compatibility) and which may be updated from time to time; and (ii) successfully passes the Android

☐ I have read and agree with the above terms and conditions

android-studio-ide-173.4819257-windows.exe

3: Click on next button in given dialog box.


Welcome to Android Studio Setup

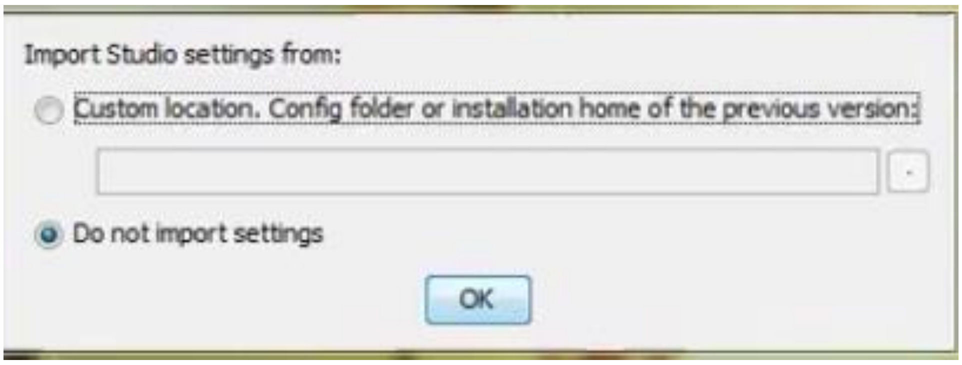
Setup will guide you through the installation of Android Studio.

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

4: It will start the installation and will show completed once done.

5: Once “Finish” is clicked, it will ask whether the previous settings need to be imported or not .Choose as per your requirements.


Import Studio settings from:

Custom location. Config folder or installation home of the previous version:

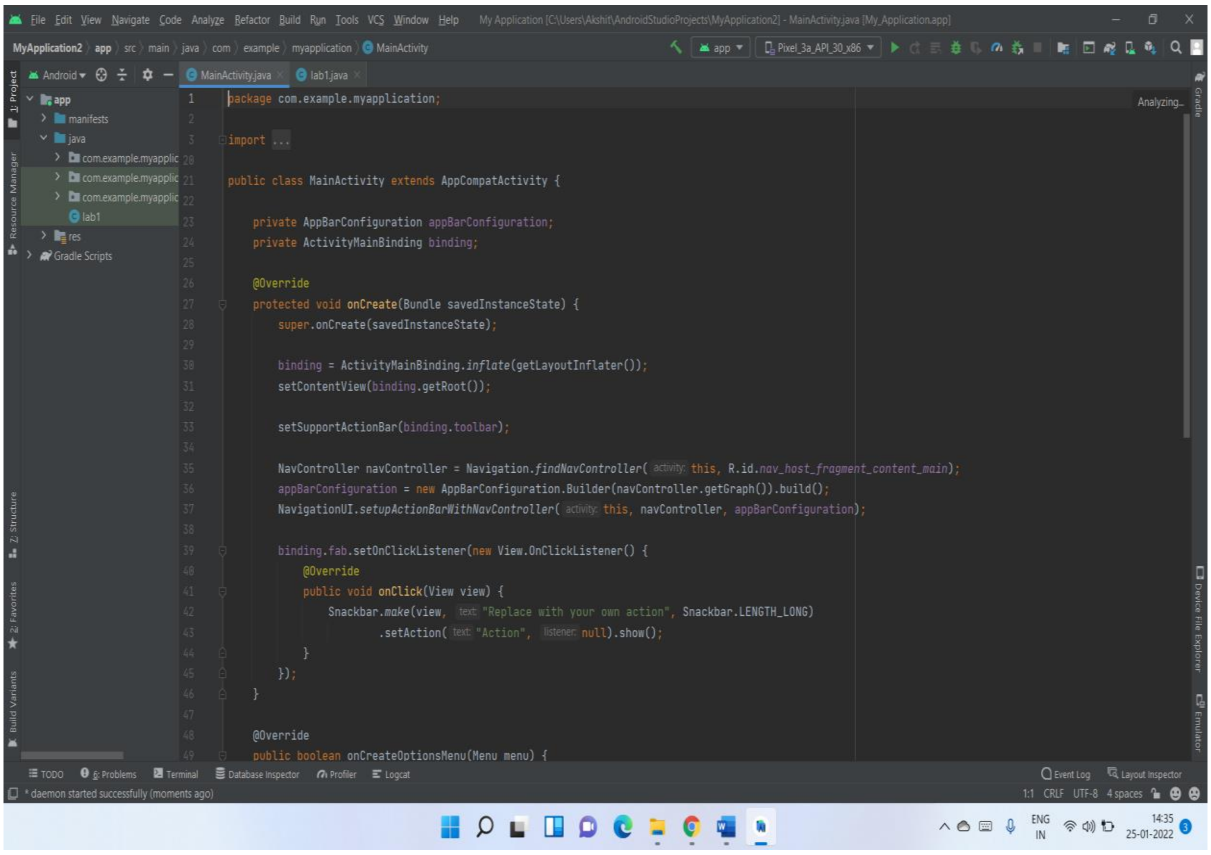
[✓ Do not import settings]

6: This will start the Android Studio.
Now it will find the available SDK components.

7: After it has found the SDK components, it will redirect to the Welcome dialog box. Choose Standard and click on Next. Now choose the theme, whether you want the Light theme or the Dark theme

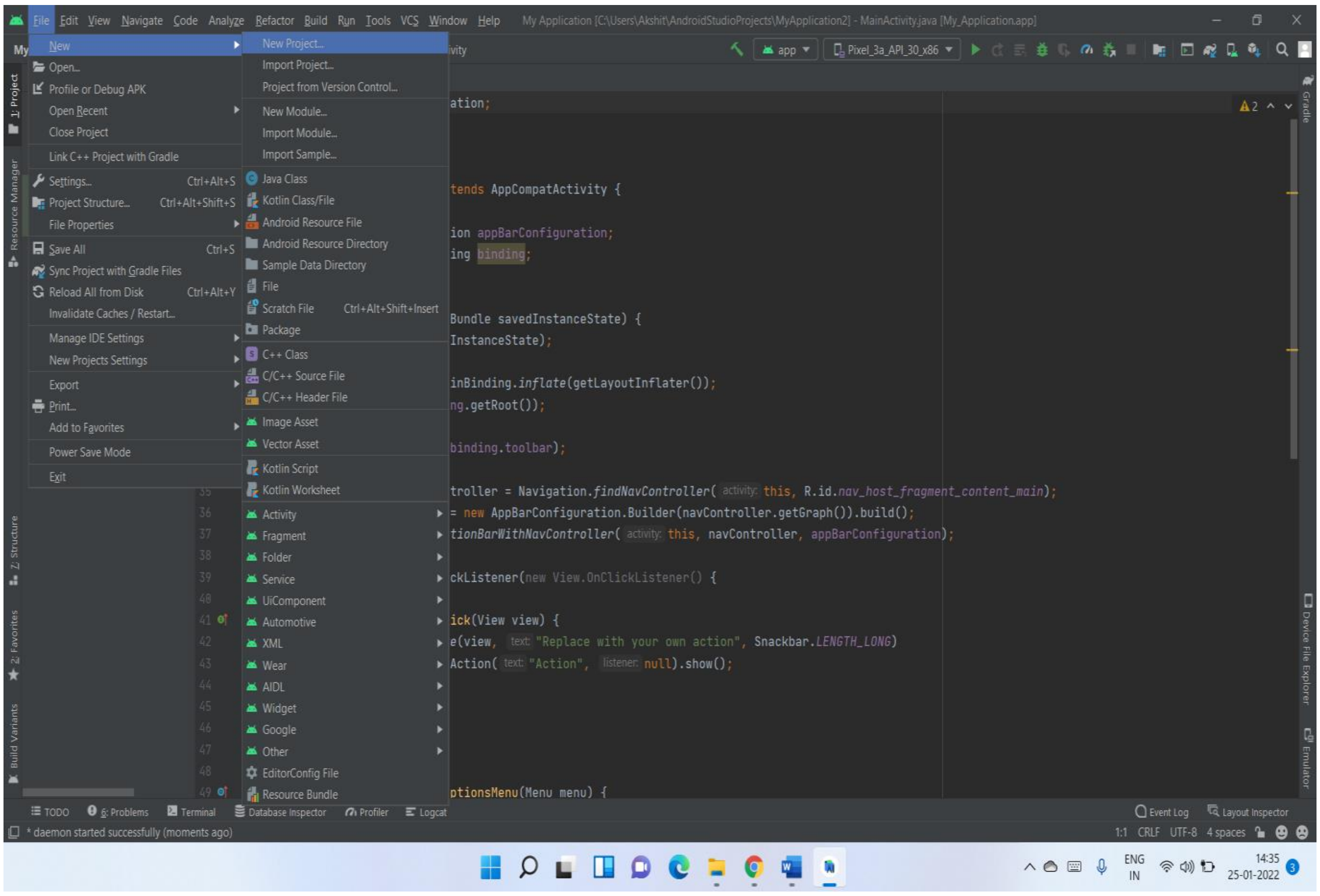
8: Now it will begin to download the SDK components.

The Android Studio has been successfully configured. Now it’s time to launch and build apps. Click on the Finish button to launch it.



```java
package com.example.myapplication;

import ...

public class MainActivity extends AppCompatActivity {

    private AppBarConfiguration appBarConfiguration;
    private ActivityMainBinding binding;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        binding = ActivityMainBinding.inflate(getLayoutInflater());
        setContentView(binding.getRoot());

        setSupportActionBar(binding.toolbar);

        NavController navController = Navigation.findNavController( activity: this, R.id.nav_host_fragment_content_main);
        appBarConfiguration = new AppBarConfiguration.Builder(navController.getGraph()).build();
        NavigationUI.setupActionBarWithNavController( activity: this, navController, appBarConfiguration);

        binding.fab.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Snackbar.make(view,  text: "Replace with your own action", Snackbar.LENGTH_LONG)
                        .setAction( text: "Action",  listener: null).show();
            }
        });
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
```

```
* daemon started successfully (moments ago)
```



My Application [C:\Users\Akshit\AndroidStudioProjects\MyApplication2] - MainActivity.java [My_Application.app]

```
ation;

tends AppCompatActivity {

ion appBarConfiguration;
ing binding;

Bundle savedInstanceState) {
InstanceState);

inBinding.inflate(getLayoutInflater());
ng.getRoot());

binding.toolbar);

troller = Navigation.findNavController( activity: this, R.id.nav_host_fragment_content_main);
= new AppBarConfiguration.Builder(navController.getGraph()).build();
tionBarWithNavController( activity: this, navController, appBarConfiguration);

ckListener(new View.OnClickListener() {

ick(View view) {
e(view,  text: "Replace with your own action", Snackbar.LENGTH_LONG)
Action( text: "Action",  listener: null).show();




ptionsMenu(Menu menu) {
```

* daemon started successfully (moments ago)

LAB 2

Working with J2ME Features

a. Create a program which creates a menu

b. Event Handling

Working with J2ME Features
a. Create a program which creates a menu
b. Event Handling
c. Input Checking

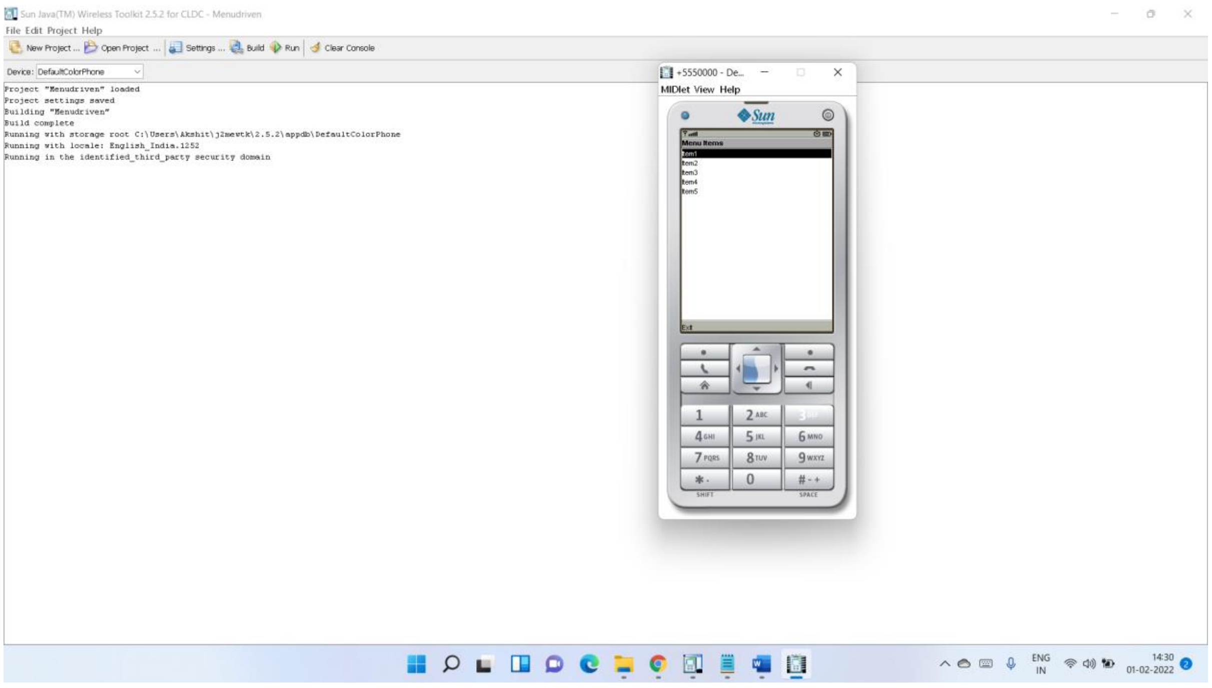
a)

Simple Menu creation with j2me

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

import javax.microedition.midlet.*;


public class Menudriven extends MIDlet implements CommandListener {


    Display = null;


    List menu = null;



    TextBox input = null;


  static final Command backCommand = new Command("Back", Command.BACK, 0);

    static final Command mainMenuCommand = new Command("Main",
Command.SCREEN, 1);

    static final Command exitCommand = new Command("Exit", Command.STOP, 2);

    String currentMenu = null;



    public Menudriven() {

    }
```

```
public void startApp() {
  display = Display.getDisplay(this);

  menu = new List("Menu Items", Choice.IMPLICIT);
  menu.append("Item1", null);
  menu.append("Item2", null);
  menu.append("Item3", null);
  menu.append("Item4", null);
  menu.append("Item5", null);
  menu.addCommand(exitCommand);
  menu.setCommandListener(this);

  mainMenu();
}

public void pauseApp() {

}

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



void mainMenu() {
  display.setCurrent(menu);
  currentMenu = "Main";
}
```

```
  public void commandAction(Command c, Displayable d) {
    String label = c.getLabel();
    if (label.equals("Exit")) {
      destroyApp(true);
    } else if (label.equals("Back")) {
        if(currentMenu.equals("item1") || currentMenu.equals("item2") ||
currentMenu.equals("item3")|| currentMenu.equals("item4")|| currentMenu.equals("item5"))
          {

        mainMenu();
       }

    }




  }
}
```



```
Project "Menudriven" loaded
Project settings saved
Building "Menudriven"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

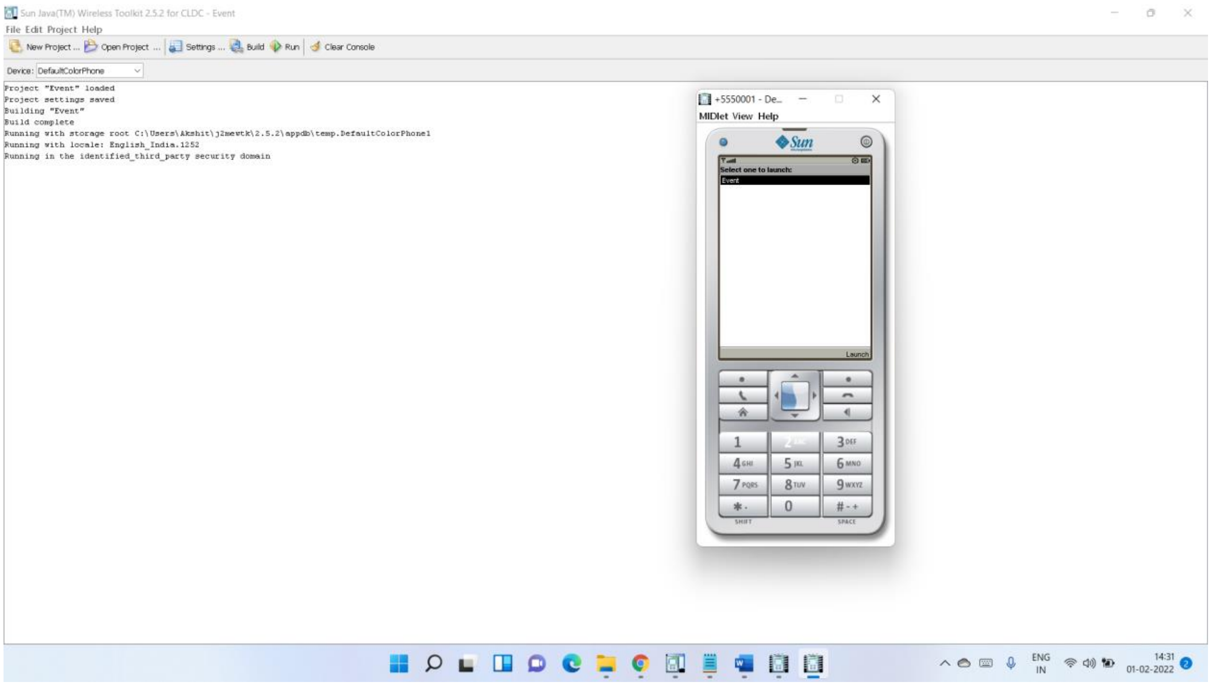
Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Menudriven
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
Menu Items
Item1
Item2
Item3
Item4
Item5
Exit

b) event handling

```
import javax.microedition.midlet.*;
import javax.microedition.lcdui.*;
public class Event extends MIDlet {
 Display;
 Command exit;
 public Event() {
 display = Display.getDisplay(this);
 }
 public void destroyApp (boolean unconditional) {
 }
 public void pauseApp () {
 System.out.println("App paused.");
 }
 public void startApp () {
 display = Display.getDisplay(this);
 Canvas = new Canvas() {
```

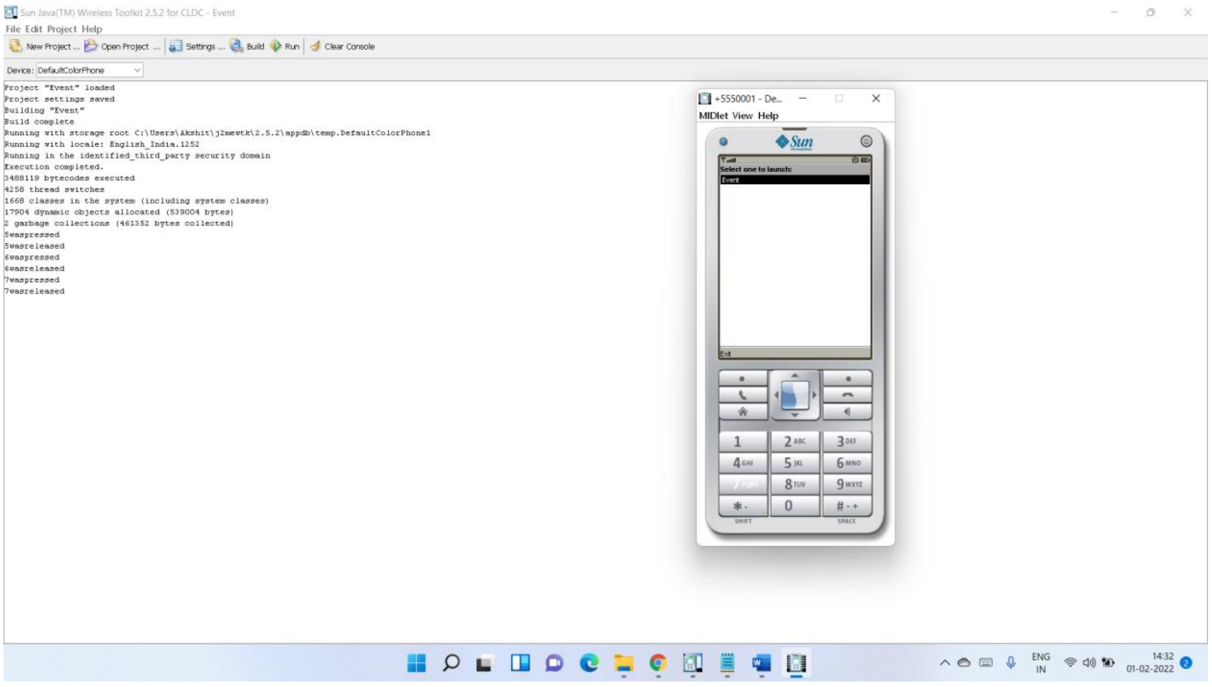
```
public void paint(Graphics g) {
}
protected void keyPressed(int key) {
if (key > 0) {
System.out.println( ((char)key)+"was"+"pressed ");
} else {
System.out.println("keyPressed action "
+getGameAction(key));
}
}
protected void keyReleased(int key) {
if (key > 0) {
System.out.println( ((char)key)+"was"+"released");
} else {
System.out.println("keyReleased action "
+getGameAction(key));
}
}
};

exit = new Command("Exit", Command.STOP, 1);
canvas.addCommand(exit);
canvas.setCommandListener(new CommandListener() {
public void commandAction(Command c, Displayable d) {
if(c == exit) {
notifyDestroyed();
} else {
System.out.println("Saw the command: "+c);
}
}
```

```
 });
 display.setCurrent(canvas);
 }
}
```



Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Event
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550001 - De...
MIDlet View Help
Select one to launch:
Event
Launch

```
Project "Event" loaded
Project settings saved
Building "Event"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\temp.DefaultColorPhone1
Running with locale: English_India.1252
Running in the identified_third_party security domain
```



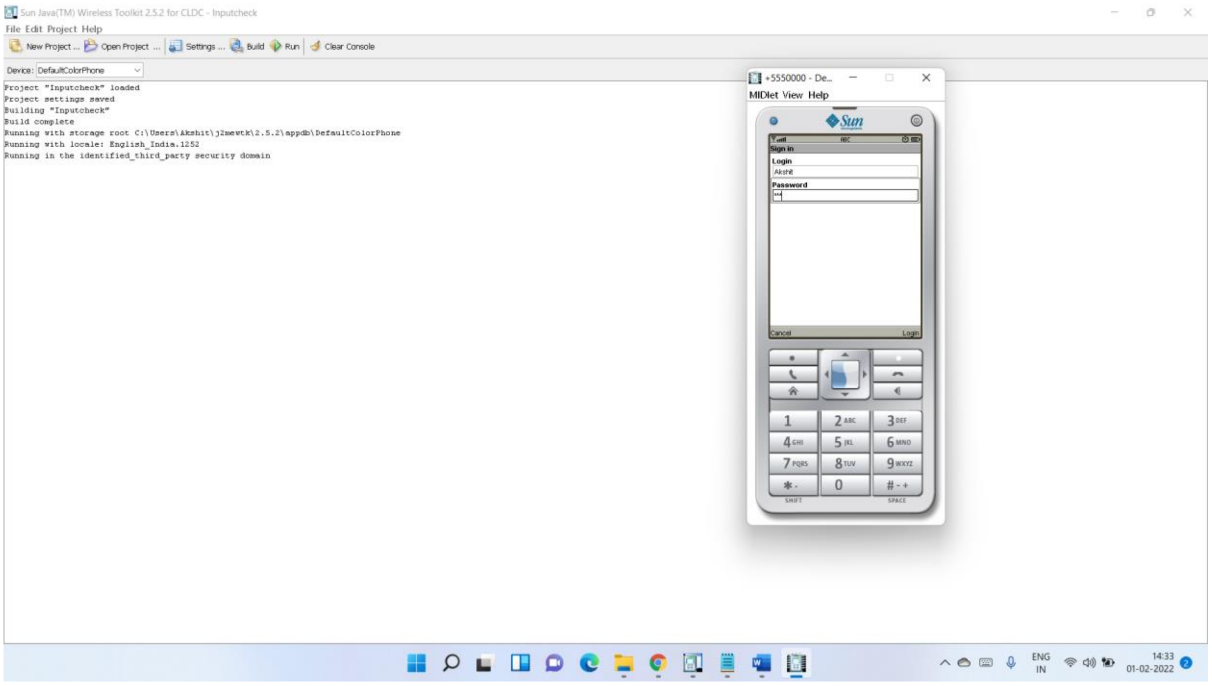
Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Event
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550001 - De...
MIDlet View Help
Select one to launch:
Event
Exit

```
Project "Event" loaded
Project settings saved
Building "Event"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\temp.DefaultColorPhone1
Running with locale: English_India.1252
Running in the identified_third_party security domain
Execution completed.
3488119 bytecodes executed
4258 thread switches
1668 classes in the system (including system classes)
17904 dynamic objects allocated (539004 bytes)
2 garbage collections (461352 bytes collected)
5waspressed
5wasreleased
6waspressed
6wasreleased
7waspressed
7wasreleased
```

c) input checking

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

public class Inputcheck extends MIDlet implements CommandListener {
   Display;

 TextField user = new TextField("Login", "", 20, TextField.ANY);

 TextField password = new TextField("Password", "", 20, TextField.PASSWORD);

   Form = new Form("Sign in");

Command cancel = new Command("Cancel", Command.CANCEL, 2);

  Command login = new Command("Login", Command.OK, 2);

  public void startApp() {
    display = Display.getDisplay(this);
    form.append(user);
    form.append(password);
    form.setCommandListener(this);
    display.setCurrent(form);

form.addCommand(cancel);
    form.addCommand(login);
  }

  public void pauseApp() {
  }

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

  public void validateUser(String name, String password) {
    if (name.equals("AKSHIT") && password.equals("123")) {
      menu();
    } else {
      tryAgain();
    }
  }

  public void menu() {
    List services = new List("Choose one", Choice.EXCLUSIVE);
    services.append("Contact", null);
    services.append("Address", null);

    display.setCurrent(services);
  }
```

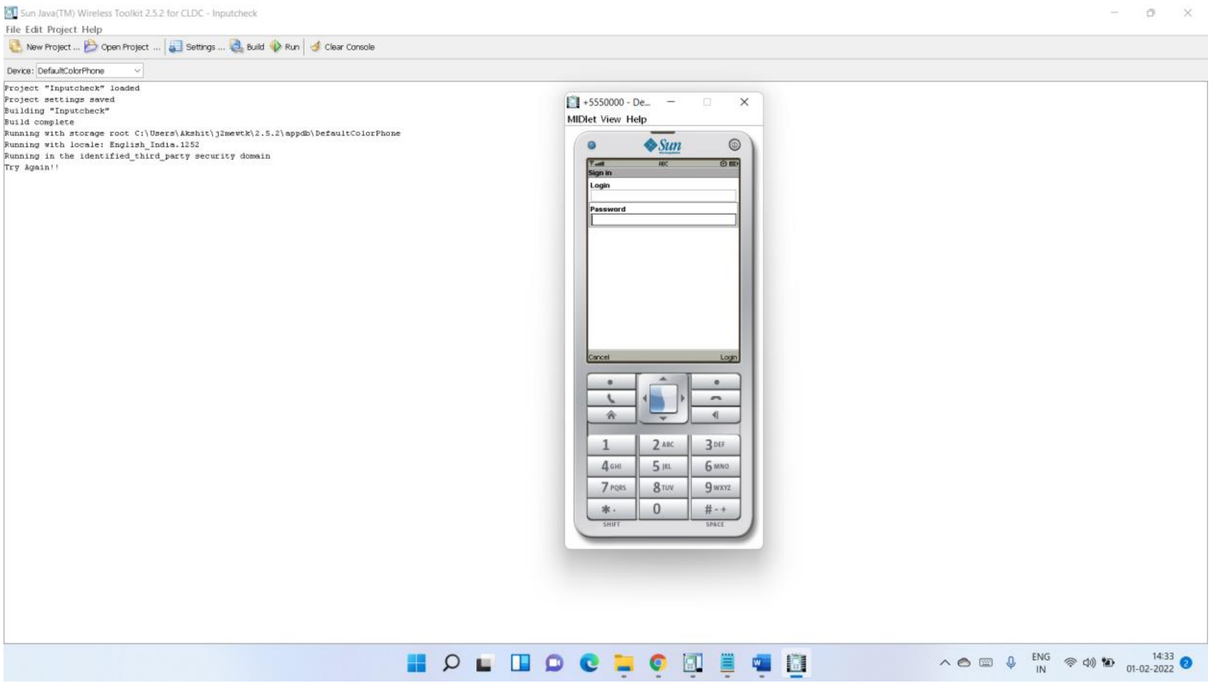
```
public void tryAgain() {
System.out.println("Try Again!!");
  user.setString("");
  password.setString("");
  display.setCurrent(form);
 }

public void commandAction(Command c, Displayable d) {
  String label = c.getLabel();
  if (label.equals("Cancel")) {
    destroyApp(true);
  } else if (label.equals("Login")) {
    validateUser(user.getString(), password.getString());
  }
 }
}
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Inputcheck
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
+5550000 - De...
MIDlet View Help
Sign in
Cancel
Login

Device: DefaultColorPhone

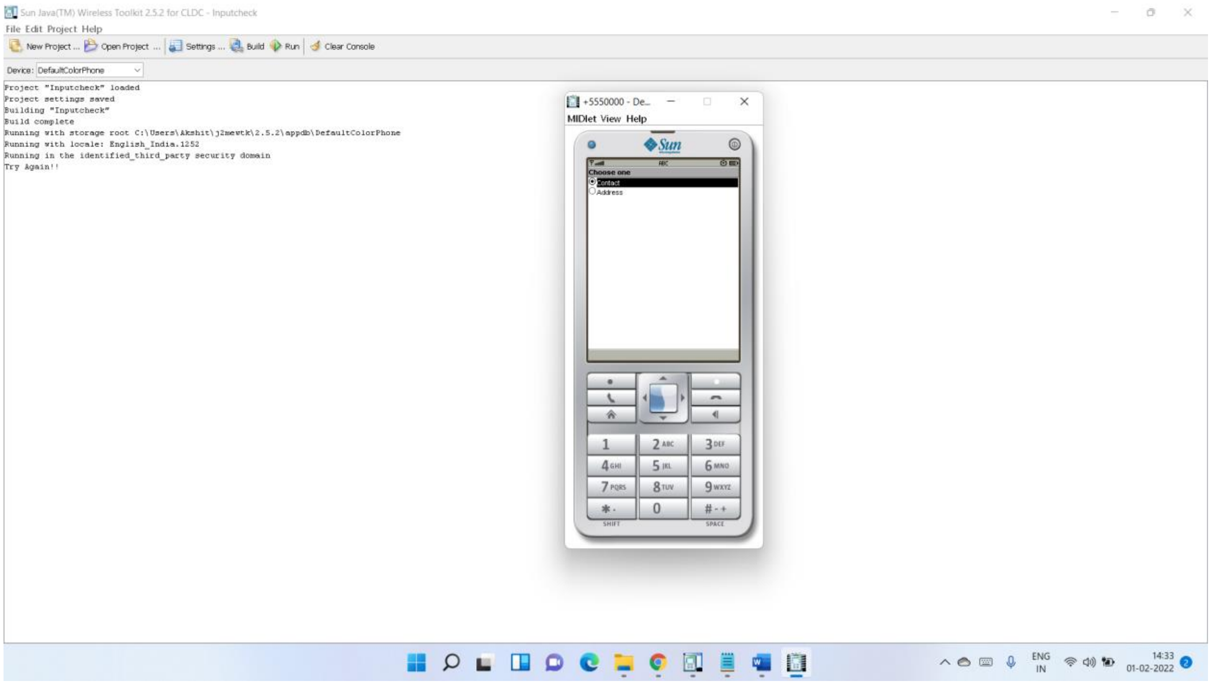
```
Project "Inputcheck" loaded
Project settings saved
Building "Inputcheck"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

Login: Akshit
Password: ***


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Inputcheck
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Sign in
Login
Password
Cancel
Login
ENG IN
14:33
01-02-2022

```
Project "Inputcheck" loaded
Project settings saved
Building "Inputcheck"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
Try Again!!
```

With correct password


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Inputcheck
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Choose one
Contact
Address
ENG IN
14:33
01-02-2022

```
Project "Inputcheck" loaded
Project settings saved
Building "Inputcheck"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
Try Again!!
```

LAB 3

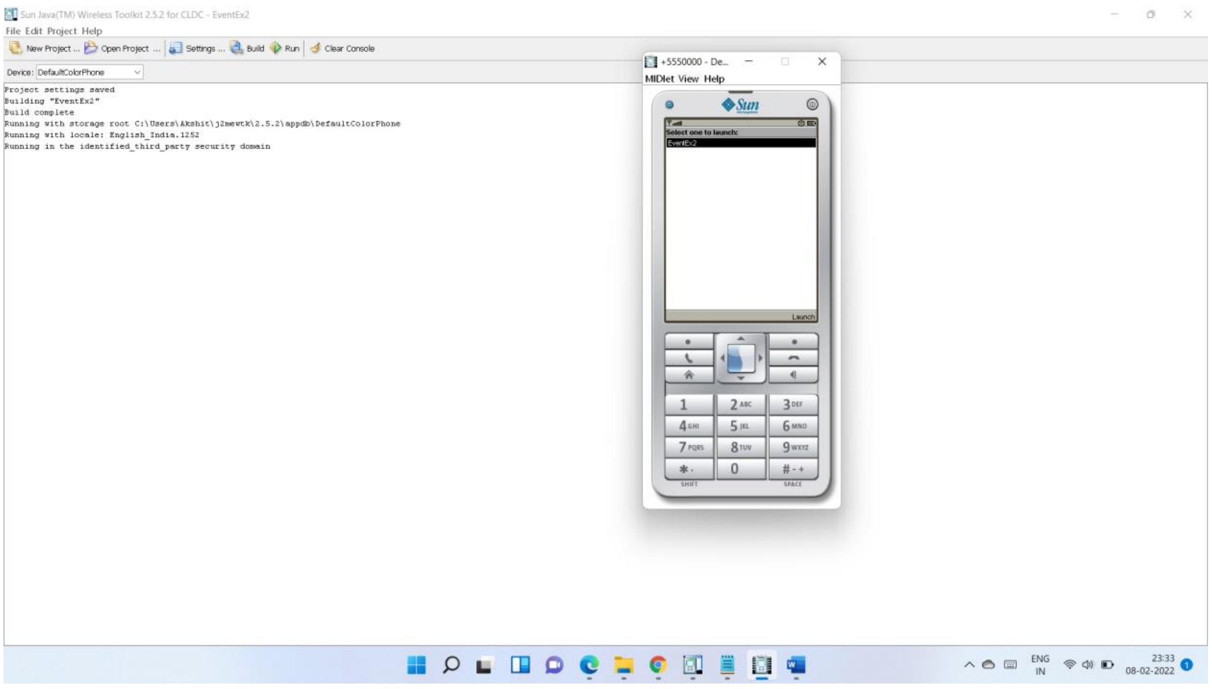
Develop an application that uses GUI components, Font and Colors

GUI COMPONENTS

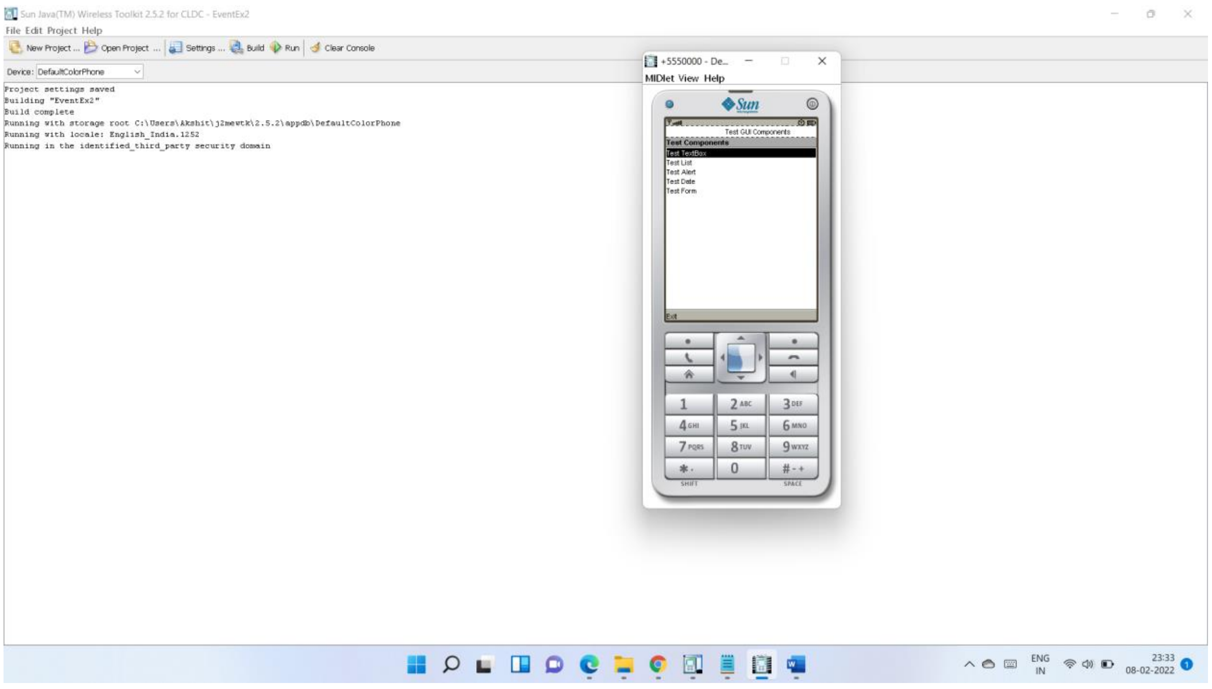
```
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;
public class EventEx2 extends MIDlet implements CommandListener {

 Display = null;




 List menu = null;

 List choose = null;

 TextBox input = null;

 Ticker = new Ticker("Test GUI Components");

 final Alert soundAlert = new Alert("sound Alert");

 DateField date = new DateField("Today's date: ",
 DateField.DATE);

 Form = new Form("Form for Stuff");


 Gauge = new Gauge("Gauge Label", true, 10, 0);

 TextField = new TextField("TextField Label", "abc",
 50, 0);
```

```
static final Command backCommand = new Command("Back",
Command.BACK, 0);
static final Command mainMenuCommand = new Command("Main",
Command.SCREEN, 1);
static final Command exitCommand = new Command("Exit",
Command.STOP, 2);
String currentMenu = null;

public EventEx2() {
}

public void startApp() throws MIDletStateChangeException {
display = Display.getDisplay(this);
menu = new List("Test Components", Choice.IMPLICIT);
menu.append("Test TextBox", null);
menu.append("Test List", null);
menu.append("Test Alert", null);
menu.append("Test Date", null);
menu.append("Test Form", null);
menu.addCommand(exitCommand);
menu.setCommandListener(this);
menu.setTicker(ticker);
mainMenu();
}
public void pauseApp() {
display = null;
choose = null;
menu = null;
ticker = null;
```

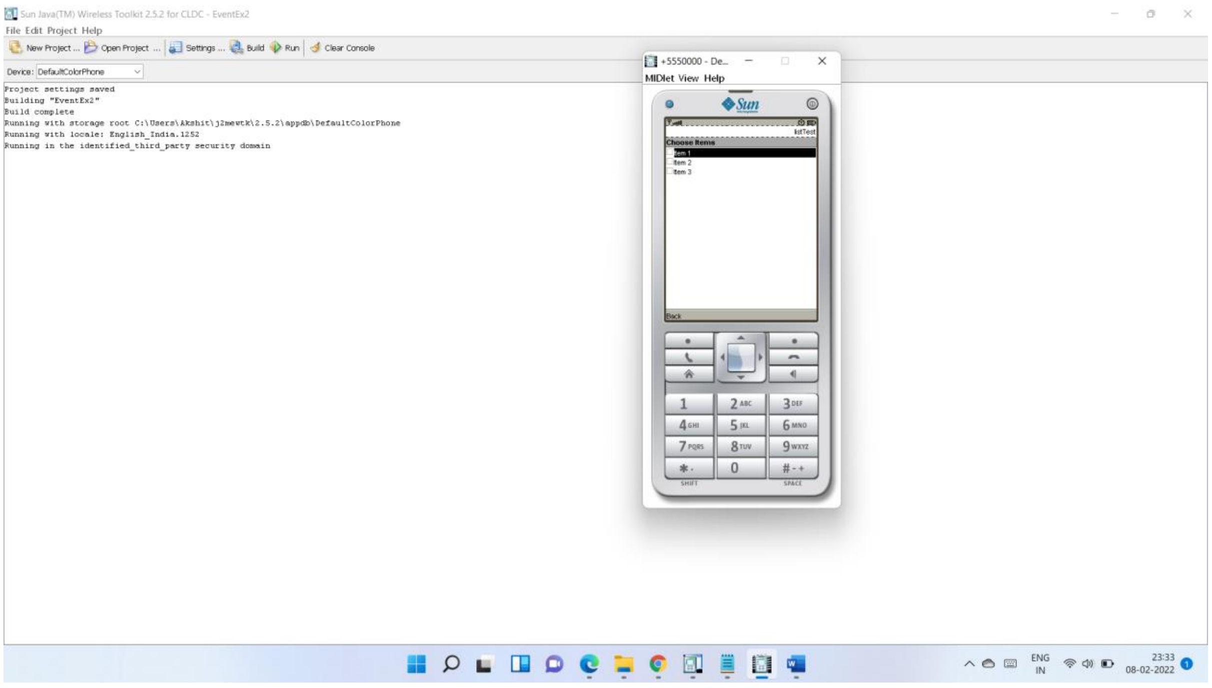
```
form = null;
input = null;
gauge = null;
textfield = null;
}
public void destroyApp(boolean unconditional) {
notifyDestroyed();
}

void mainMenu() {
display.setCurrent(menu);
currentMenu = "Main";
}

public void testTextBox() {
input = new TextBox("Enter Some Text:", "", 5,
TextField.ANY);
input.setTicker(new Ticker("testTextBox"));
input.addCommand(backCommand);
input.setCommandListener(this);
input.setString("");
display.setCurrent(input);
currentMenu = "input";
}


public void testList() {
choose = new List("Choose Items", Choice.MULTIPLE);
choose.setTicker(new Ticker("listTest"));
choose.addCommand(backCommand);
choose.setCommandListener(this);
choose.append("Item 1", null);
choose.append("Item 2", null);
choose.append("Item 3", null);
display.setCurrent(choose);
currentMenu = "list";
}

public void testAlert() {
soundAlert.setType(AlertType.ERROR);
soundAlert.setString("** ERROR **");
display.setCurrent(soundAlert);
}

public void testDate() {
java.util.Date now = new java.util.Date();
date.setDate(now);
Form f = new Form("Today's date");
f.append(date);
f.addCommand(backCommand);
f.setCommandListener(this);
display.setCurrent(f);
currentMenu = "date";
}

public void testForm() {
form.append(gauge);
form.append(textfield);
form.addCommand(backCommand);
form.setCommandListener(this);
display.setCurrent(form);
currentMenu = "form";
}

public void commandAction(Command c, Displayable d) {
String label = c.getLabel();
if (label.equals("Exit")) {
destroyApp(true);
} else if (label.equals("Back")) {
if(currentMenu.equals("list") ||
currentMenu.equals("input") ||
currentMenu.equals("date") ||
currentMenu.equals("form")) {

mainMenu();
}
} else {
List down = (List)display.getCurrent();
switch(down.getSelectedIndex()) {
case 0: testTextBox();break;
case 1: testList();break;
case 2: testAlert();break;
case 3: testDate();break;
case 4: testForm();break;
}
}
}
}
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - EventEx2
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Select one to launch:
EventEx2
Launch
ENG IN
23:33 08-02-2022

```
Project settings saved
Building "EventEx2"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

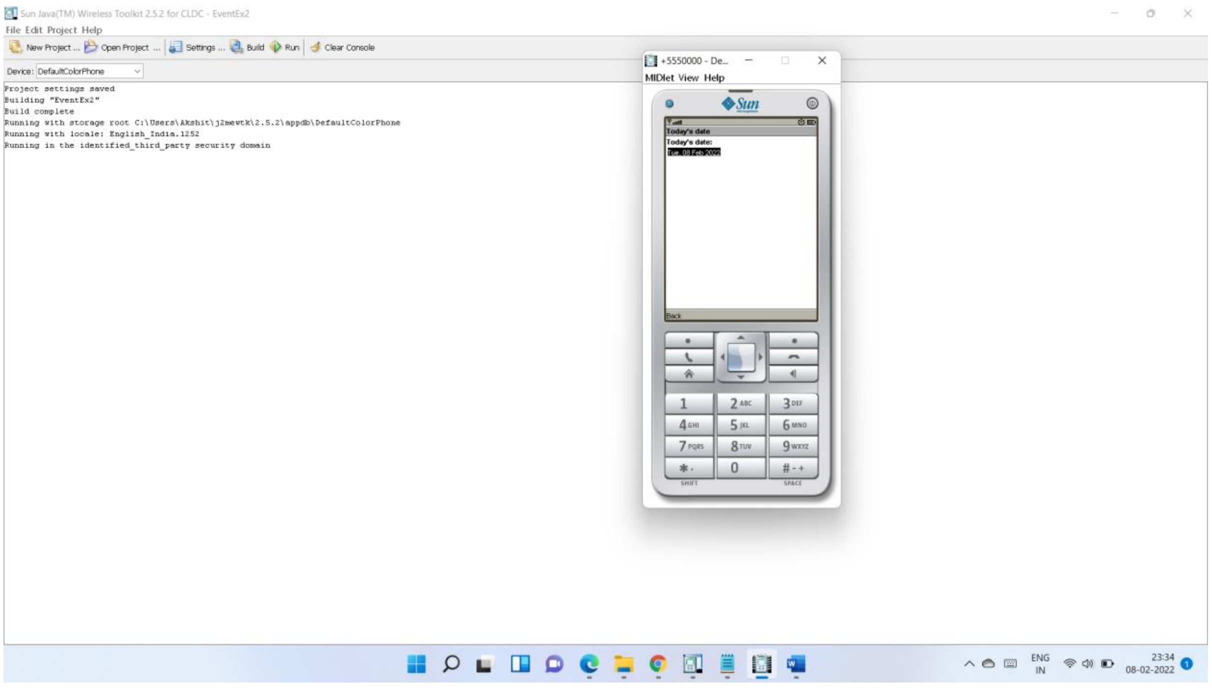


```
Project settings saved
Building "EventEx2"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - EventEx2
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
listTest
Back
23:33
08-02-2022

```
Project settings saved
Building "EventEx2"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

Choose Items
- Item 1
- Item 2
- Item 3


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - EventEx2
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Back
23:34
08-02-2022

```
Project settings saved
Building "EventEx2"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

Today's date

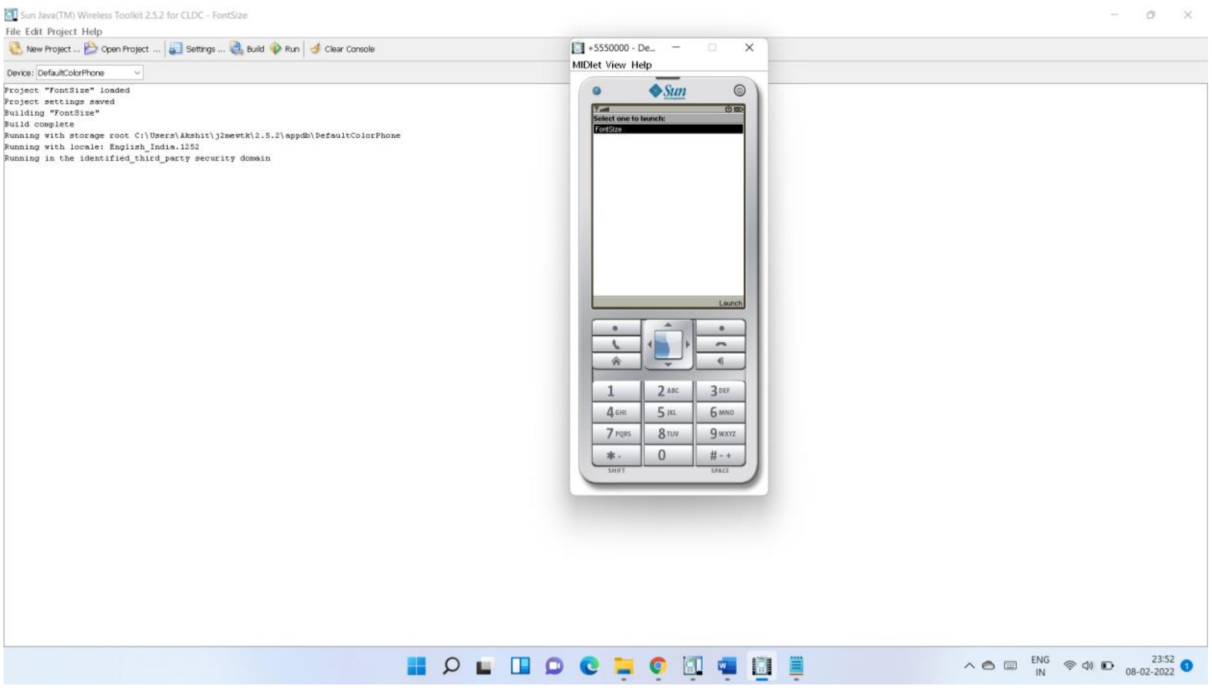
Today's date:
Tue, 08 Feb 2022

Setting font size and colour of screen

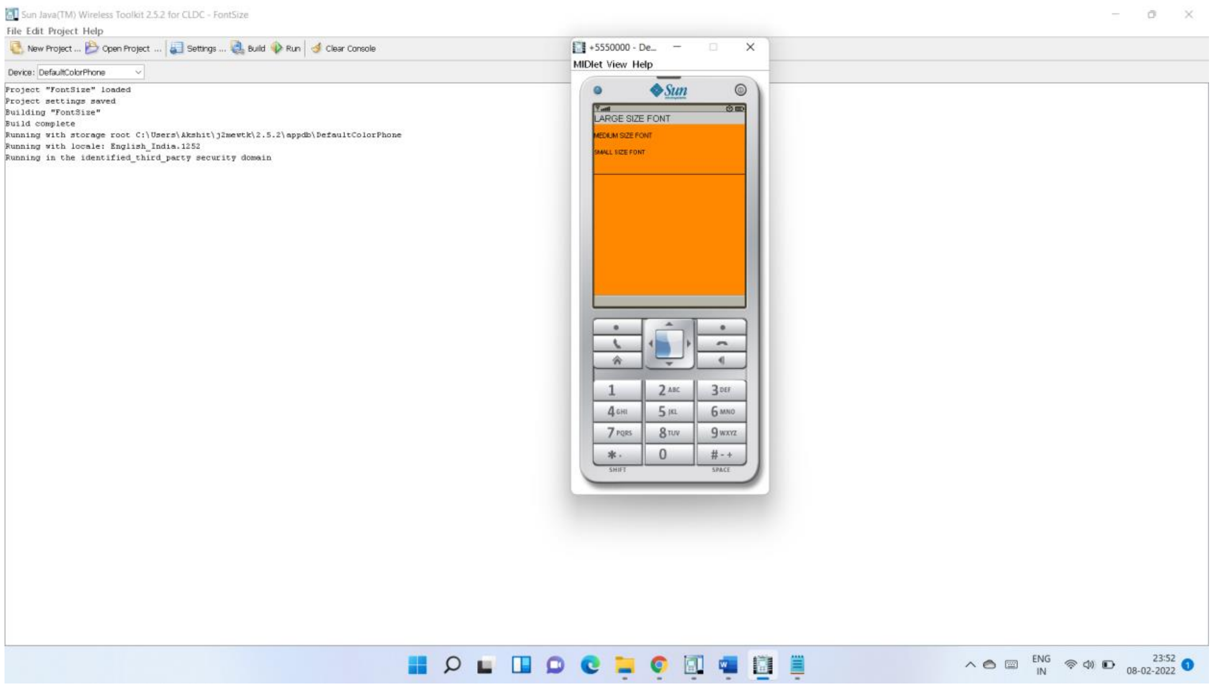
```
import java.io.*;
import java.lang.*;
import javax.microedition.io.*;
import javax.microedition.rms.*;
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;

public class FontSize extends MIDlet {
  public static final boolean COLOR = false;
  public static final boolean DEBUG = false;
  private Display = null;
  private FontCanvas = null;
  private boolean painting = false;

  public FontSize() {
  display = Display.getDisplay(this);
  fontCanvas = new FontCanvas(this);
  }

  public void startApp() throws MIDletStateChangeException {
  display.setCurrent(fontCanvas);
  }

  public void pauseApp() {}

protected void destroyApp(boolean unconditional) throws
```

```
MIDletStateChangeException {}

  class FontCanvas extends Canvas {
  private FontSize parent = null;
  private int width = getWidth();
  private int height = getHeight();

  public FontCanvas(FontSize parent) {
  this.parent = parent;
  }

  public void paint(Graphics g) {
  g.setColor(255, 128, 0);
  g.fillRect(0, 0, width, height);
            Font font1 = Font.getFont(Font.FACE_SYSTEM, Font.STYLE_PLAIN,
Font.SIZE_LARGE);
            Font font2 = Font.getFont(Font.FACE_SYSTEM, Font.STYLE_PLAIN,
Font.SIZE_MEDIUM);
            Font font3 = Font.getFont(Font.FACE_SYSTEM,
Font.STYLE_PLAIN,Font.SIZE_SMALL);
  int position = 0;
  if(COLOR){
  g.setColor(255, 255, 255);
  }else{
  g.setColor(192, 192, 192);
  g.fillRect(0, position, width, font1.getHeight());
  }
  if(COLOR){
  g.setColor(255, 255, 255);
  }else{
  g.setColor(0, 0, 0);
```

```
 }
 g.setFont(font1);
 g.drawString("LARGE SIZE FONT", 0, position, Graphics.LEFT | Graphics.TOP);

 position = position + font1.getHeight() + 10;
 g.setFont(font2);
 g.drawString("MEDIUM SIZE FONT", 0, position, Graphics.LEFT | Graphics.TOP);
 g.setColor(0, 0, 0);
 position = position + font1.getHeight() + 10;
 g.setFont(font3);
 g.drawString("SMALL SIZE FONT", 0, position, Graphics.LEFT | Graphics.TOP);
 position = position + font1.getHeight() + 10;
 g.drawLine(0, font3.getHeight() + position - 1, width, font3.getHeight()+ position - 1);
 painting = false;
 }
 }
}
```



```
Project "FontSize" loaded
Project settings saved
Building "FontSize"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```



```
Project "FontSize" loaded
Project settings saved
Building "FontSize"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

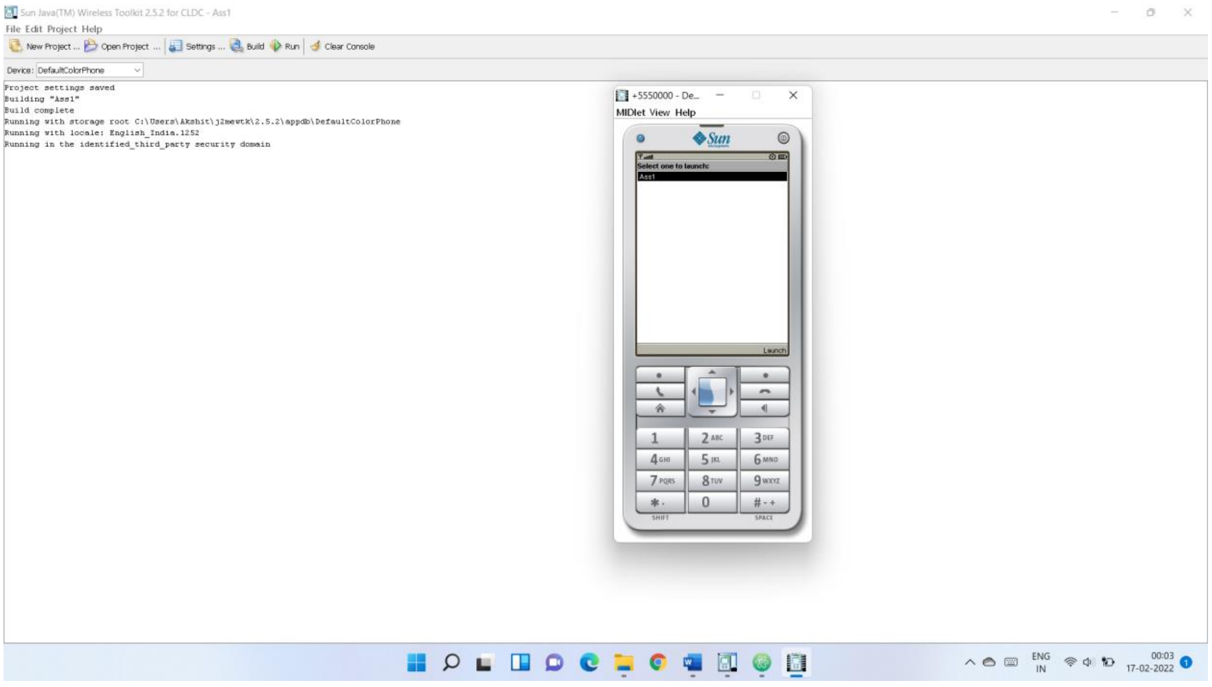
LAB-4

Develop an application that uses Layout Managers and event listeners.

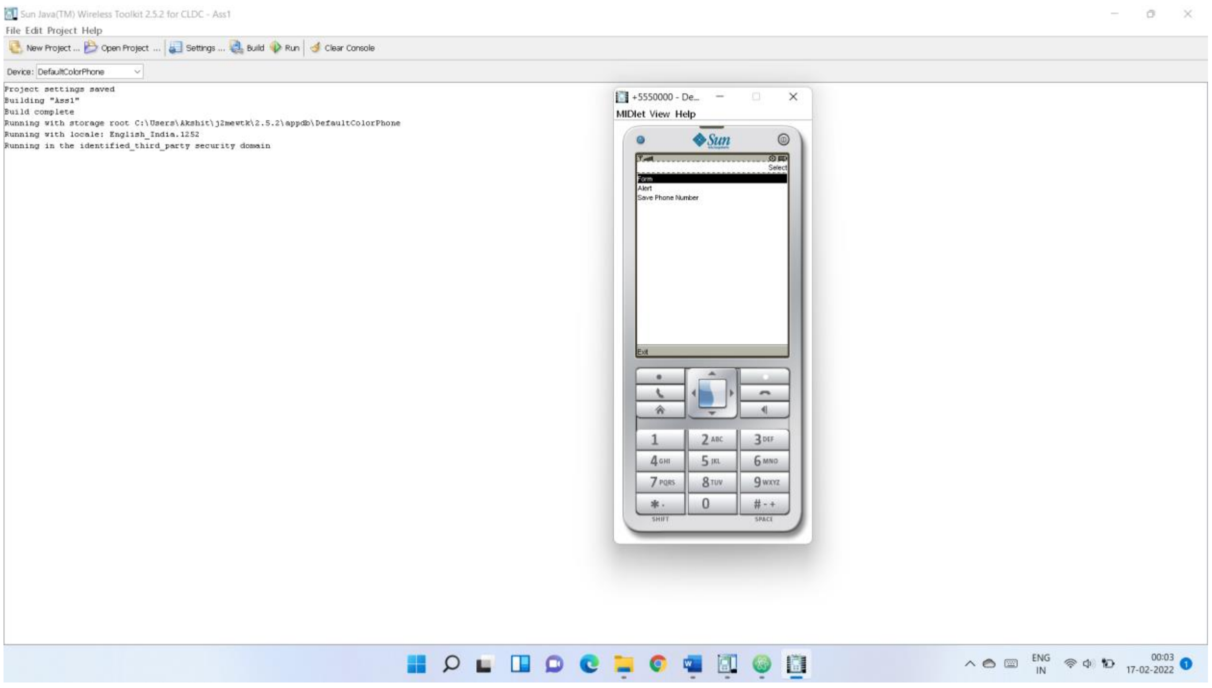
```
import javax.microedition.midlet.*;
import javax.microedition.lcdui.*;
public class Ass1 extends MIDlet implements CommandListener
{
  Display;
  Command exitCommand;
  Command backCommand;
  Command okCommand;
  List itemMenu;
  TextBox textbox;
  Ticker;
  Alert;
  Form;
  StringItem;
  ImageItem;
  Image;
  TextField textItem;
  ChoiceGroup choiceItem;
  DateField dateItem;
  Gauge gaugeItem;
  public Ass1()
  {
    display = Display.getDisplay(this);
    exitCommand = new Command("Exit", Command.EXIT, 1);
    backCommand = new Command("Back", Command.BACK, 2);
    okCommand = new Command("OK", Command.OK, 3);
    ticker = new Ticker("Select an item to display");
    itemMenu = new List(null, Choice.IMPLICIT);
    itemMenu.append("Form", null);
    itemMenu.append("Alert", null);
```

```
 itemMenu.append("Save Phone Number", null);
 itemMenu.setCommandListener(this);
 itemMenu.addCommand(exitCommand);
 itemMenu.setTicker(ticker);
 display.setCurrent(itemMenu);
 }
 public void startApp () {
 }
 public void destroyApp (boolean unconditional) {
 }
 public void pauseApp () {
 }
 public void commandAction(Command c, Displayable s) {
 if (c == backCommand) {
 display.setCurrent(itemMenu);
 }
 else if (s == itemMenu) {
 if (c == List.SELECT_COMMAND) {
 int i = itemMenu.getSelectedIndex();
 switch (i) {
 case 0: // Show the form
 display.setCurrent(getForm());
break;
 case 1: // Show an alert
 display.setCurrent(getAlert("Warning", "This"));
 break;
 case 2: // Show TextBox
 display.setCurrent(getTextBox());
 }
 } else if (c == exitCommand) {
```

```
 notifyDestroyed();
 }
 } else if (s == textbox) {
 String value = textbox.getString();
 alert = getAlert("Text Entered:", value);
 display.setCurrent(alert, itemMenu);
 } else if (s == form) {
 alert = getAlert("Image option saved", "");
 display.setCurrent(alert, itemMenu);
 }
 }
 TextBox getTextBox() {
 if (textbox == null) {
 textbox = new TextBox("Enter a phone number","", 40,
TextField.PHONENUMBER);
 textbox.addCommand(backCommand);
 textbox.addCommand(okCommand);
 textbox.setCommandListener(this);
 }
 return textbox;
 }

 Alert getAlert(String title, String contents) {
 if (alert == null) {
 alert = new Alert(title);
 alert.setType(AlertType.WARNING);
 alert.setTimeout(2000);
 alert.setString(contents);
 } else {
 alert.setTitle(title);
 alert.setString(contents);
 }
 return alert;
 }

 Form getForm() {
 if (form == null) {
 form = new Form("Options");
 try {
 image = Image.createImage("/myimage.png");
 imageItem = new ImageItem("Akshit:", image,
ImageItem.LAYOUT_CENTER, "Akshit");
 form.append(imageItem);
 } catch (java.io.IOException ex) {
 }
 textItem = new TextField("Title:", "Akshit", 32,
TextField.ANY);
 form.append(textItem);

 dateItem = new DateField("Date:", DateField.DATE);
 dateItem.setDate(new java.util.Date());
 form.append(dateItem);
 choiceItem = new ChoiceGroup("Size:", Choice.EXCLUSIVE);
 choiceItem.append("Small", null);
 choiceItem.append("Large", null);
 form.append(choiceItem);

 gaugeItem = new Gauge("Rate:", true, 10, 5);
 form.append(gaugeItem);
 form.addCommand(backCommand);
 form.addCommand(okCommand);
 form.setCommandListener(this);
 }
 return form;
 }
}
```

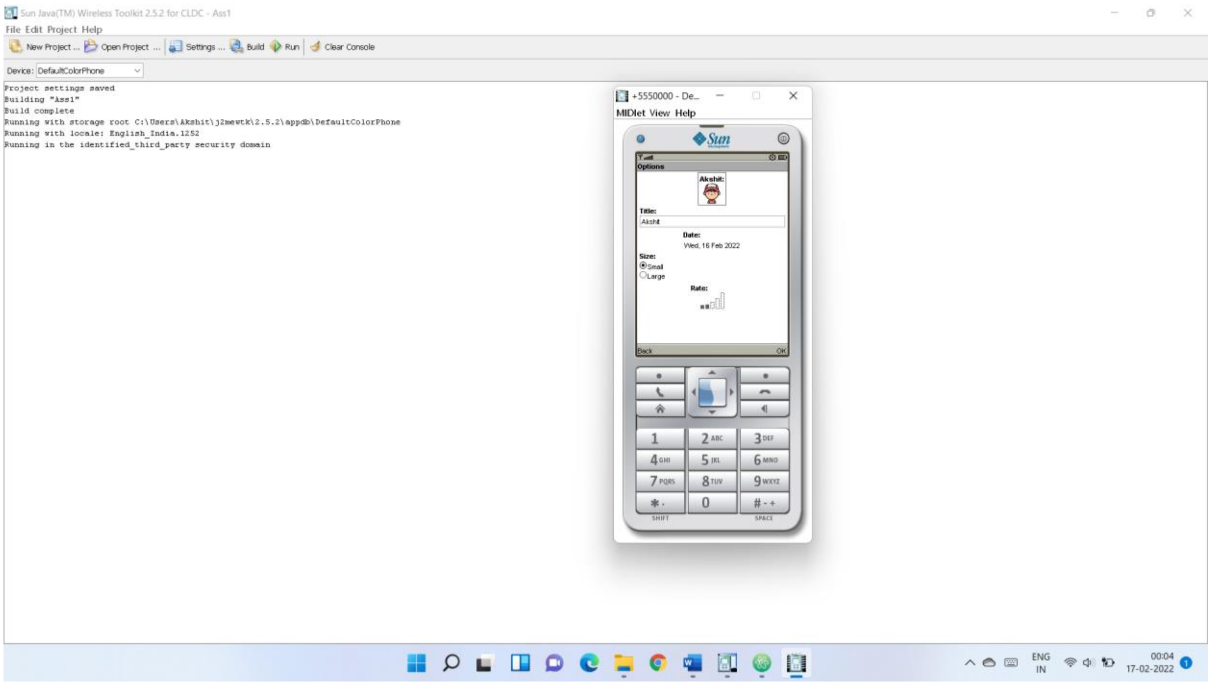


```
Project settings saved
Building "Ass1"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Ass1
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Select
Exit

```
Project settings saved
Building "Ass1"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

Form
Alert
Save Phone Number


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Ass1
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Options
Back
OK

```
Project settings saved
Building "Ass1"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

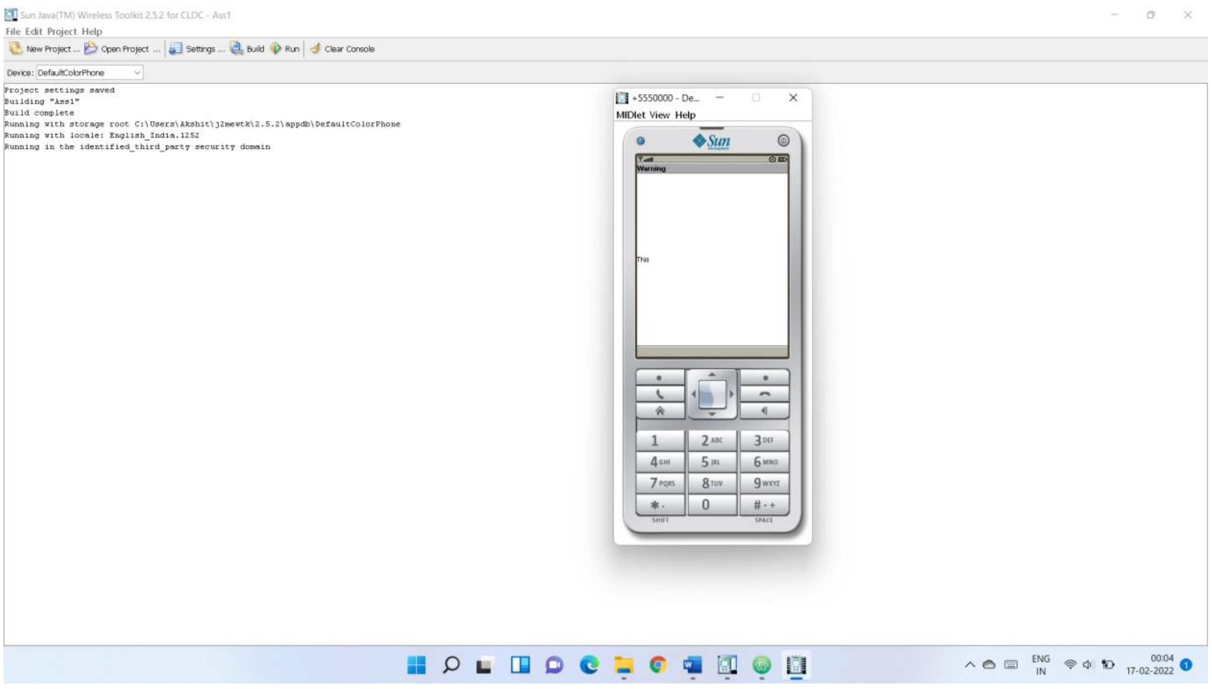
Akshit:

Title: Akshit

Date: Wed, 16 Feb 2022

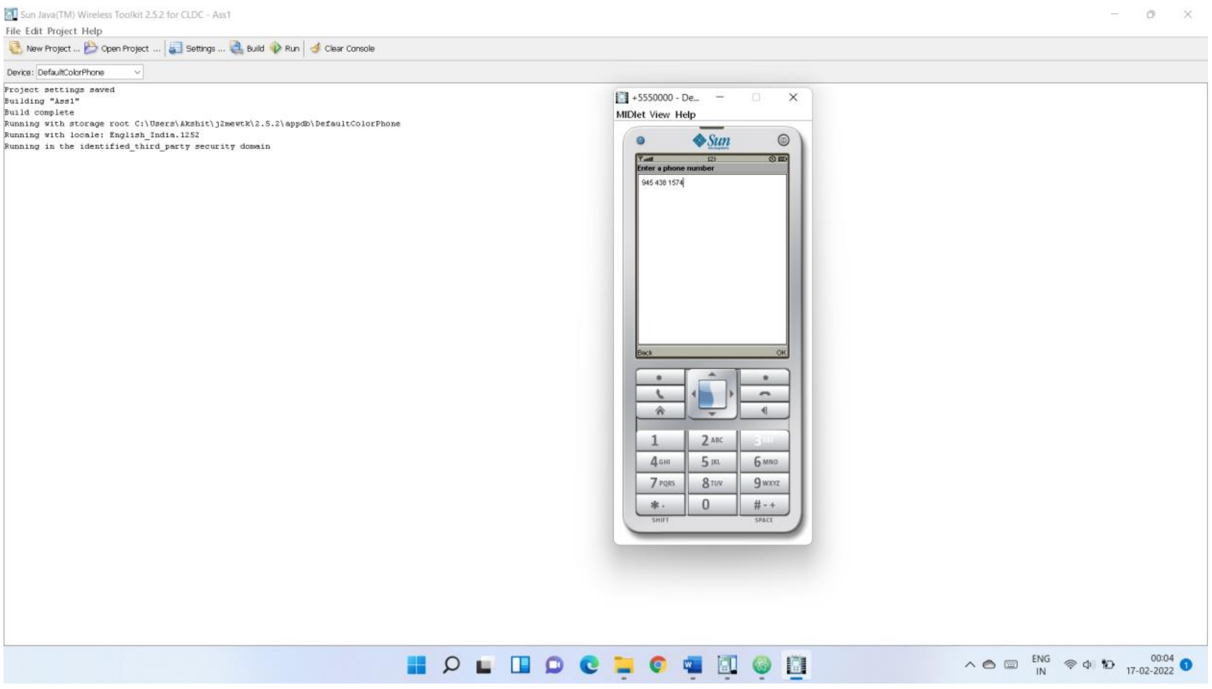
Size:
[✓ Small]
Large

Rate:



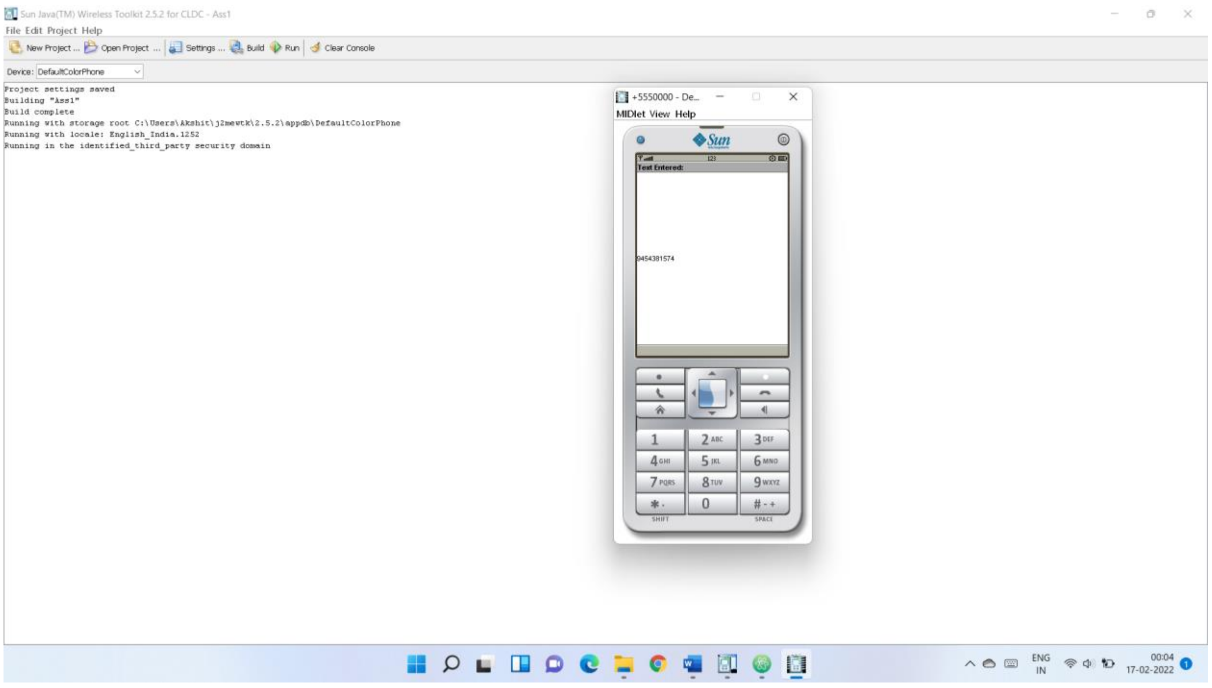
Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Ass1
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Warning
This

```
Project settings saved
Building "Ass1"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```



Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Ass1
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Enter a phone number
945 438 1574
Back
OK

```
Project settings saved
Building "Ass1"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - Ass1
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help

```
Project settings saved
Building "Ass1"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

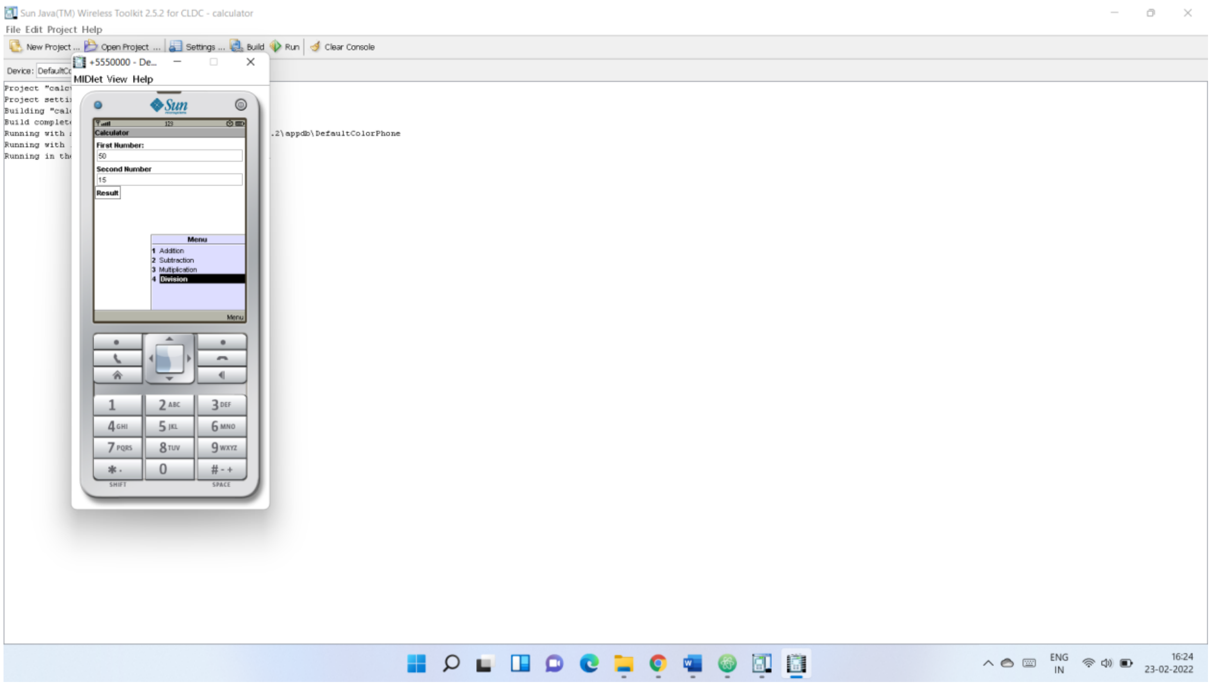
```
Text Entered:

9454381574
```

LAB 5

Develop a native calculator application.

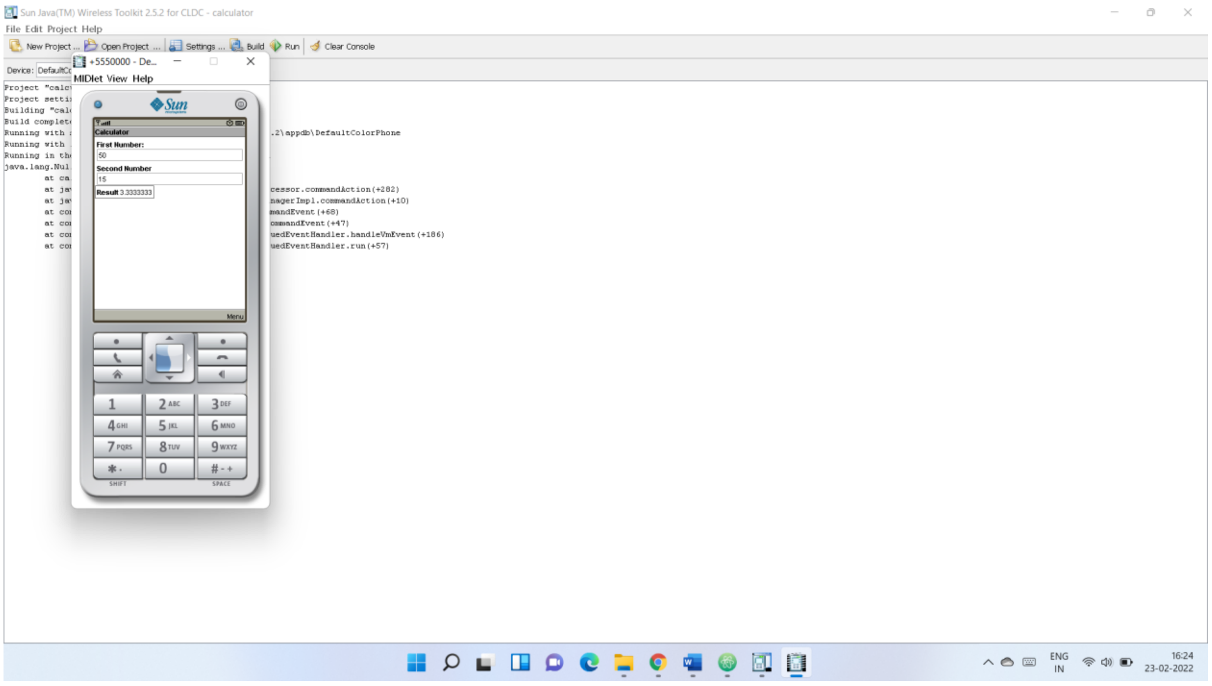
```
import javax.microedition.lcdui.*;
import javax.microedition.midlet.*;
import java.io.*;
public class calculator extends MIDlet implements CommandListener
{
 private Form;
 private Display;
 private TextField input1, input2;
 private Command add, sub, mul,div;
 private StringItem item;

 public calculator()
 {

 }
 public void startApp()
 {
  display = Display.getDisplay(this);
  Form = new Form("Calculator");

  item = new StringItem("Result", "");

  input1 = new TextField("First Number:", "", 30, TextField.NUMERIC);
  input2 = new TextField("Second Number", "", 30, TextField.NUMERIC);
  form.append(input1);
  form.append(input2);
  add = new Command("Addition", Command.OK, 1);
  sub = new Command("Subtraction", Command.OK, 1);
  mul = new Command("Multiplication", Command.OK, 1);
  div = new Command("Division", Command.OK, 1);
  form.addCommand(add);
  form.addCommand(sub);
  form.addCommand(mul);
  form.addCommand(div);
  form.append(item);

  form.setCommandListener(this);

  display.setCurrent(form);
 }

 public void pauseApp() { }

 public void destroyApp(boolean uncondn)
 {
  notifyDestroyed();
 }
    private void calculate()
 {float one=Float.parseFloat(input1.getString());
  float two= Float.parseFloat(input2.getString());
 float result=one+two;
 item.setText( result + "" );

}
private void calculate1()
{
 float one = Float.parseFloat(input1.getString());
 float two = Float.parseFloat(input2.getString());
 float result = one - two;
 item.setText(result + "");

}
private void calculate2()
{
 float one = Float.parseFloat(input1.getString());
 float two = Float.parseFloat(input2.getString());
 float result = one * two;
 item.setText(result + "");

}
private void calculate3()
{
 float one = Float.parseFloat(input1.getString());
 float two = Float.parseFloat(input2.getString());
 float result = one / two;
 item.setText(result + "");

}
public void commandAction(Command c, Displayable d)
{
 String label = c.getLabel();
 if (label.equals("Addition"))
 {
  calculate();

 }

 else if (label.equals("Subtraction"))
 {
  calculate1();

 }

 else if (label.equals("Multiplication"))
 {
  calculate2();
  form.append("The Answer is:");
 }

 else if (label.equals("Division"))
```

```
  {
   calculate3();
   form.append("The Answer is:");
  }
 }
}
```



```
Project "calc
Project setti
Building "cal
Build complete
Running with                         .2\appdb\DefaultColorPhone
Running with
Running in the
```

Calculator
First Number:
50
Second Number
15
Result



```
Project "calc
Project setti
Building "cal
Build complete
Running with                         .2\appdb\DefaultColorPhone
Running with
Running in the
java.lang.Nul
        at ca
        at ja                        cessor.commandAction(+282)
        at ja                        nagerImpl.commandAction(+10)
        at co                        mandEvent(+68)
        at co                        ommandEvent(+47)
        at co                        uedEventHandler.handleVmEvent(+186)
        at co                        uedEventHandler.run(+57)
```

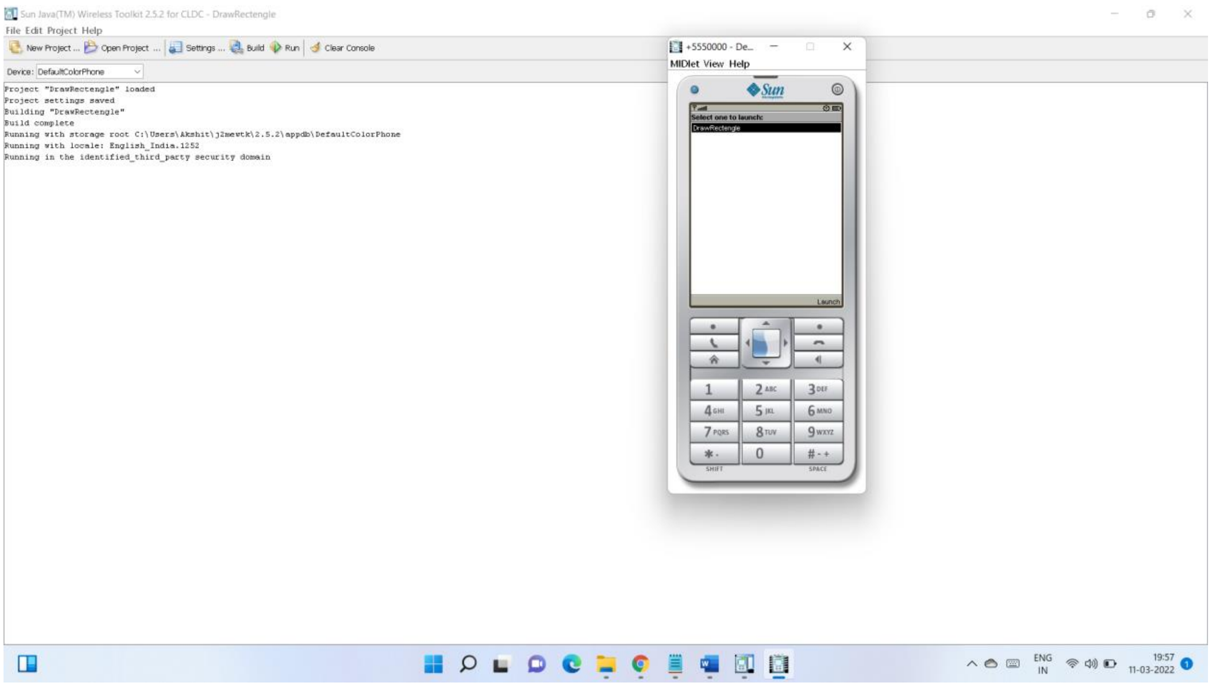
Calculator
First Number:
50
Second Number
15
Result 3.3333333

Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - calculator
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultCo
+5550000 - De...
MIDlet View Help
Menu

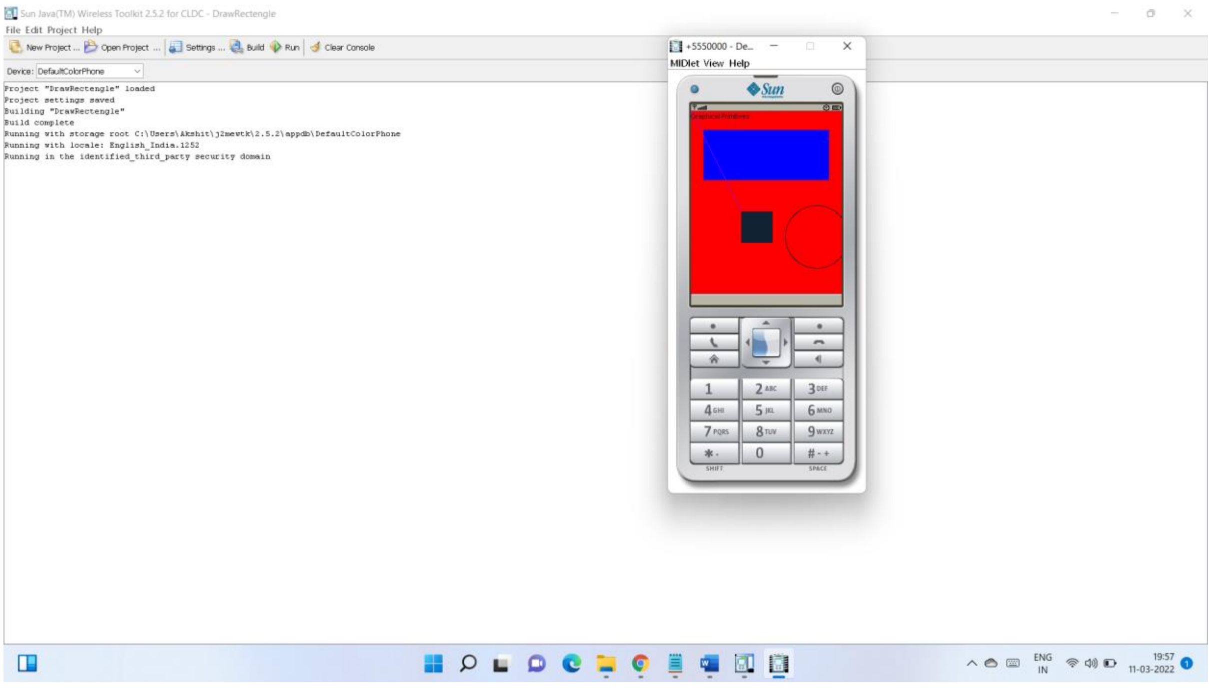
LAB 6

Write an application that draws basic graphical primitives on the screen.

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

public class DrawRectengle extends MIDlet {
  public void startApp () {
  Display.getDisplay (this).setCurrent (new DrawingDemoCanvas ());
  }

  public void pauseApp () {}

  public void destroyApp (boolean forced) {}
}

class DrawingDemoCanvas extends Canvas {
  public void paint (Graphics g) {

  g.setColor (255, 0, 0);
  g.fillRect (0, 0, getWidth (), getHeight ());
  g.setColor (0, 0, 255);
  g.fillRect (20, 30, 200, 80);
 g.setColor (128, 20, 255);
  g.drawLine (0, 0, 100, 200);

g.setColor(30,40,60);
g.fillRect(80,160,50,50);

g.drawArc(150, 150, 100, 100, 0, 360);
  }
}
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - DrawRectengle
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Select one to launch:
DrawRectengle
Launch
ENG IN
19:57
11-03-2022

```
Project "DrawRectengle" loaded
Project settings saved
Building "DrawRectengle"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - DrawRectengle
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
ENG IN
19:57
11-03-2022

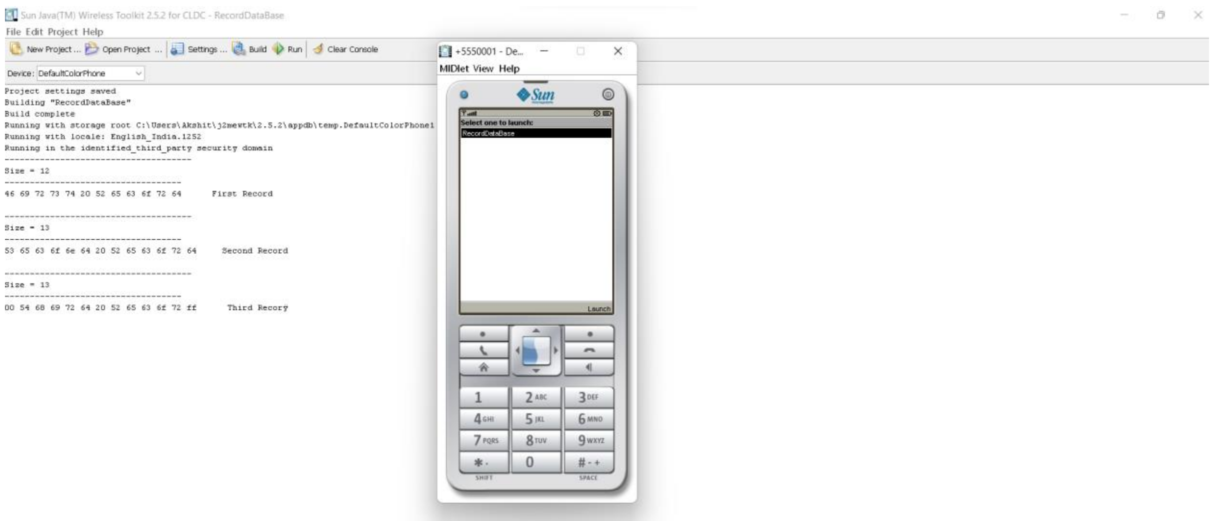
```
Project "DrawRectengle" loaded
Project settings saved
Building "DrawRectengle"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

LAB 7

Develop an application that makes use of databases.

```
import java.io.*;
import javax.microedition.midlet.*;
import javax.microedition.rms.*;

public class RecordDataBase extends MIDlet {
  static final String DBNAME = "RecordDataBase";

  public void startApp(){
  RecordStore rs = null;
  try{
  RecordStore.deleteRecordStore(DBNAME);
  } catch(Exception e){}

  try{
  rs = RecordStore.openRecordStore(DBNAME, true);
  byte[] data1 = "First Record".getBytes();
  byte[] data2 = "Second Record".getBytes();
  byte[] data3 = " Third Record".getBytes();
  data3[0] = 0;
  data3[data3.length-1] = (byte) -1;
  rs.addRecord(data1, 0, data1.length);
  rs.addRecord(data2, 0, data2.length);
  rs.addRecord(data3, 0, data3.length);
  storeData(rs, System.out);
  rs.closeRecordStore();
  }catch(RecordStoreException e){
  System.out.println(e);
  }
  notifyDestroyed();
  }

  public void pauseApp(){}

  public void destroyApp(boolean unconditional){}

  public void storeData(RecordStore rs, PrintStream out){
  if(rs == null) return;
  StringBuffer hexLine = new StringBuffer();
  StringBuffer charLine = new StringBuffer();

  try{
  int lastID = rs.getNextRecordID();
  byte[] data = new byte[100];
  int size;

  for(int i = 1; i < lastID; ++i){
  try{
  size = rs.getRecordSize(i);
  if(size > data.length){
  data = new byte[size * 2];
}
out.println("------------------------------------");
out.println("Size = " + size);
out.println("----------------------------------");
rs.getRecord(i, data, 0);
storeRecord(data, size, out, hexLine, charLine, 16);
out.println(" ");
} catch(InvalidRecordIDException e){
continue;
}
}
} catch( RecordStoreException e ){
out.println(e);
}
}

private void storeRecord(byte[] data, int size, PrintStream out,
        StringBuffer  hexLine, StringBuffer charLine, int maxLen ){
if(size == 0) return;
hexLine.setLength(0);
charLine.setLength(0);
int count = 0;
for(int i = 0; i < size; ++i){
char b = (char) (data[i] & 0xFF);

if(b < 0x10){
hexLine.append('0');
}
hexLine.append(Integer.toHexString(b));
hexLine.append(' ');

if((b >= 32 && b <= 127) ||
Character.isDigit(b) ||
Character.isLowerCase(b) ||
Character.isUpperCase(b)){
charLine.append((char)b);
} else {
charLine.append(' ');
}

if(++count >= maxLen || i == size-1){
while(count++ < maxLen){
hexLine.append(" ");
}
hexLine.append(' ');
hexLine.append(charLine.toString());
out.println( hexLine.toString());
hexLine.setLength(0);
charLine.setLength(0);
count = 0;
```

```
    }
    }
    }
  }
```

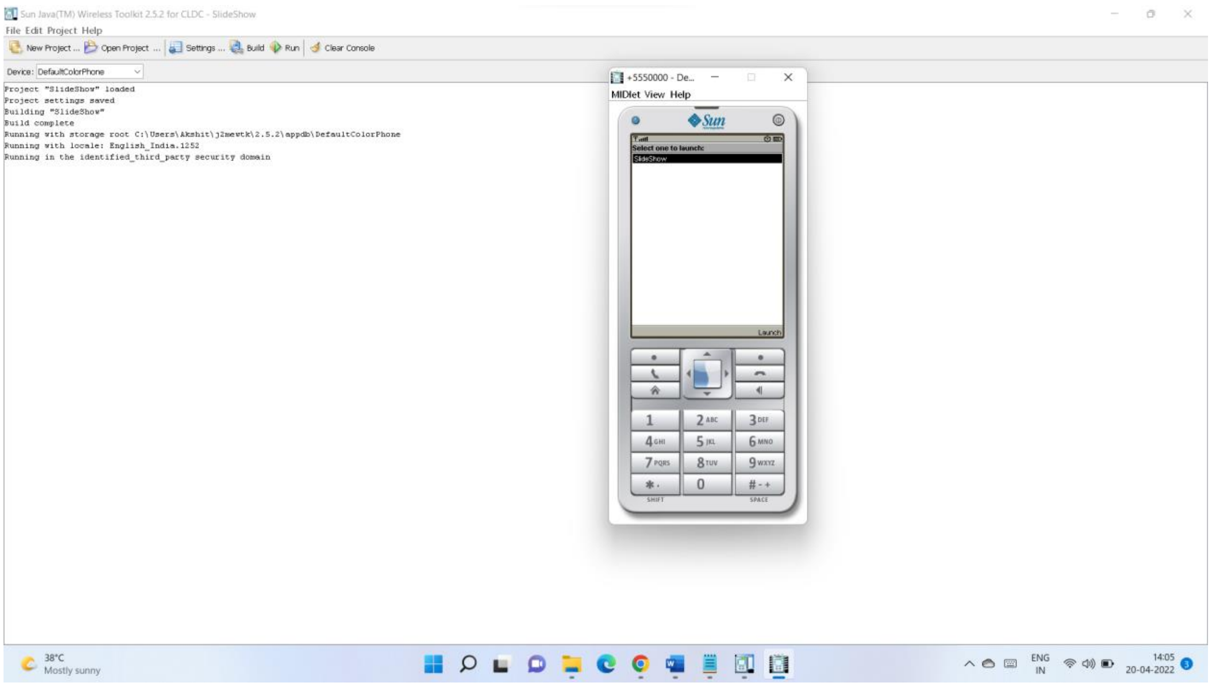

Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - RecordDataBase
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550001 - De...
MIDlet View Help
Select one to launch:
RecordDataBase
Launch

```
Project settings saved
Building "RecordDataBase"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\temp.DefaultColorPhone1
Running with locale: English_India.1252
Running in the identified_third_party security domain
------------------------------------
Size = 12
-----------------------------------
46 69 72 73 74 20 52 65 63 6f 72 64      First Record

------------------------------------
Size = 13
-----------------------------------
53 65 63 6f 6e 64 20 52 65 63 6f 72 64     Second Record

------------------------------------
Size = 13
-----------------------------------
00 54 68 69 72 64 20 52 65 63 6f 72 ff      Third Recory
```

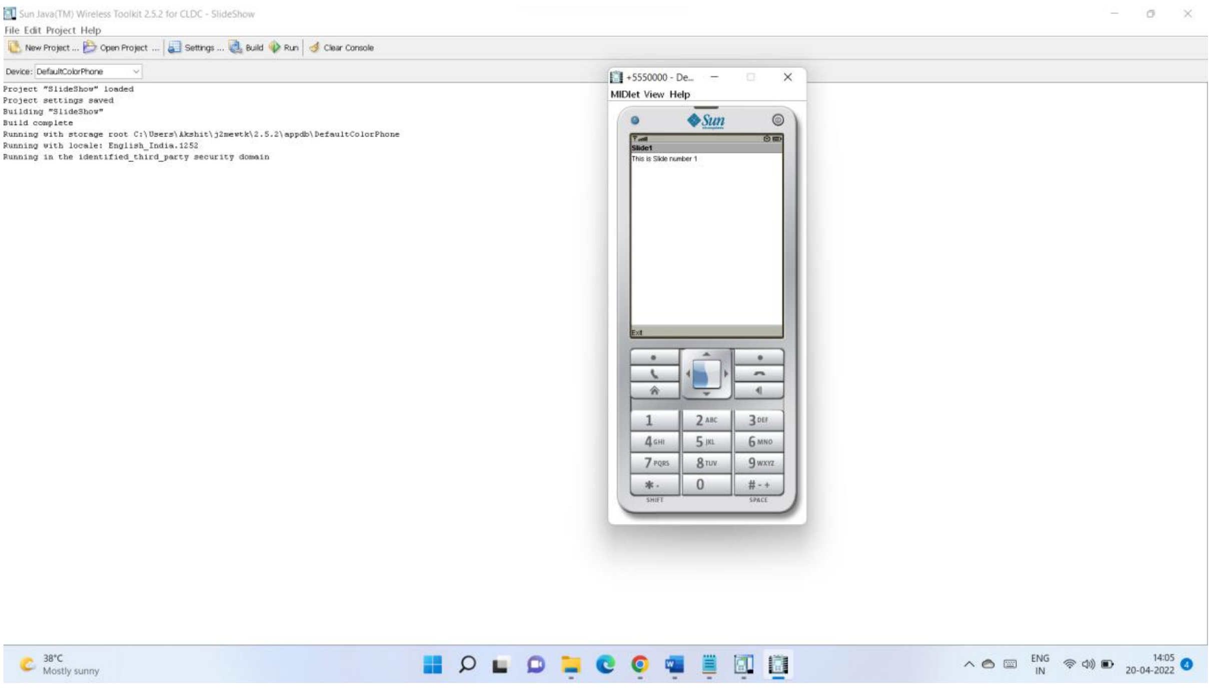
LAB 8

Implement an application that implements Multi-threading

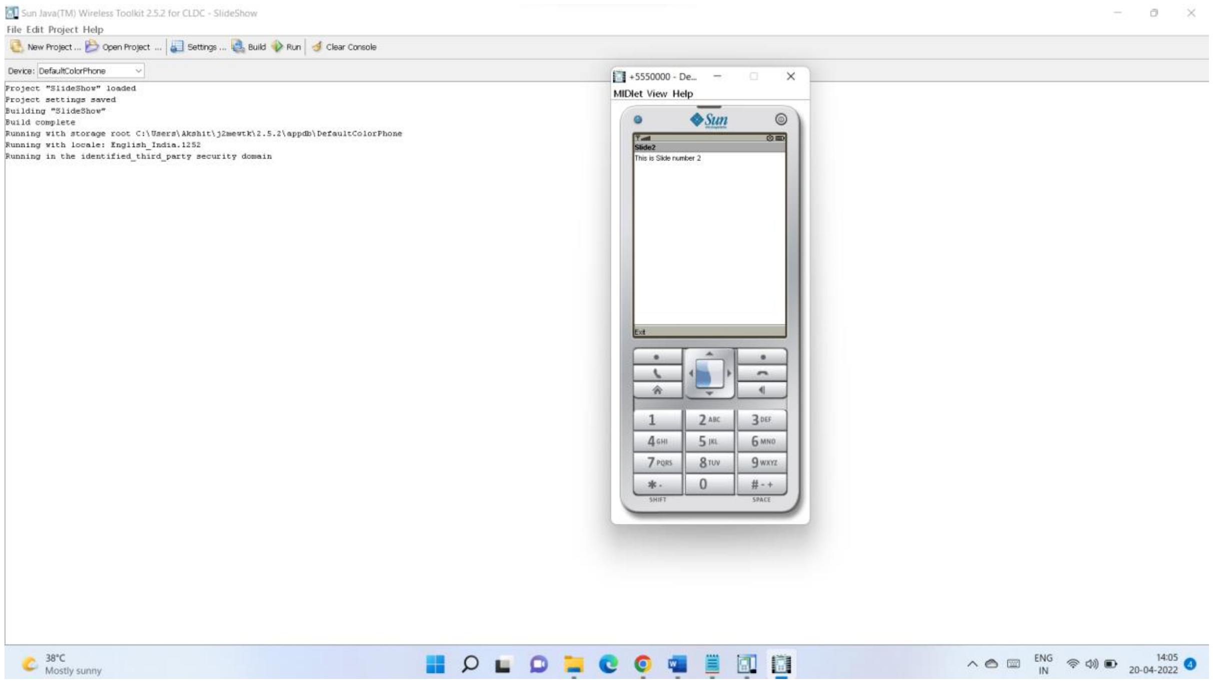
```
import javax.microedition.midlet.*;
import javax.microedition.lcdui.*;
public class SlideShow extends MIDlet implements CommandListener {
 public Form slide1;
 public Form slide2;
 public Form slide3;
 public Command Exit;
 public Display;
 public SlideShow()
 {
 display=Display.getDisplay(this);
 Exit=new Command("Exit",Command.EXIT,1);
 slide1=new Form("Slide1");
 slide1.append("This is Slide number 1");
 slide1.addCommand(Exit);
 slide2=new Form("Slide2");
 slide2.append("This is Slide number 2");
 slide2.addCommand(Exit);
 slide3=new Form("Slide3");
 slide3.append("This is Slide number 3");
 slide3.addCommand(Exit);
 slide1.setCommandListener(this);
 slide2.setCommandListener(this);
 slide3.setCommandListener(this);
 }
 public void startApp() {
 Thread runner = new Thread(new ThreadRunner(display,slide1,slide2,slide3));
 runner.start();
 }
 public void pauseApp() {
 }
 public void destroyApp(boolean unconditional) {
 }
 public void commandAction(Command command,Displayable displayable)
 {
 if(displayable==slide1)
 {
 if(command==Exit)
 notifyDestroyed();
 }
else if(displayable==slide2)
 {
 if(command==Exit)
 notifyDestroyed();
 }
 else if(displayable==slide3)
 {
 if(command==Exit)
 notifyDestroyed();
 }
 }
}
class ThreadRunner implements Runnable {
 Display;
 public int c=0;
 public Form slide1;
 public Form slide2;
 public Form slide3;
 public ThreadRunner(Display display,Form slide1,Form slide2,Form slide3) {
 this.display = display;
 this.slide1=slide1;
 this.slide2=slide2;
 this.slide3=slide3;
 }
 public void run() {
 while(true)
 {
 c++;
 if(c==1)
 display.setCurrent(slide1);
 else if(c==2)
 display.setCurrent(slide2);
 else if(c==3)
 display.setCurrent(slide3);
 else if(c==4)
 c=0;

 try
 {
 Thread.sleep(1500);
 }
 catch(Exception ex)
 { }
 } }}
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - SlideShow
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Select one to launch:
SlideShow
Launch

```
Project "SlideShow" loaded
Project settings saved
Building "SlideShow"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - SlideShow
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Slide1
This is Slide number 1
Exit

```
Project "SlideShow" loaded
Project settings saved
Building "SlideShow"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - SlideShow
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Slide2
This is Slide number 2
Exit

```
Project "SlideShow" loaded
Project settings saved
Building "SlideShow"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

LAB 9

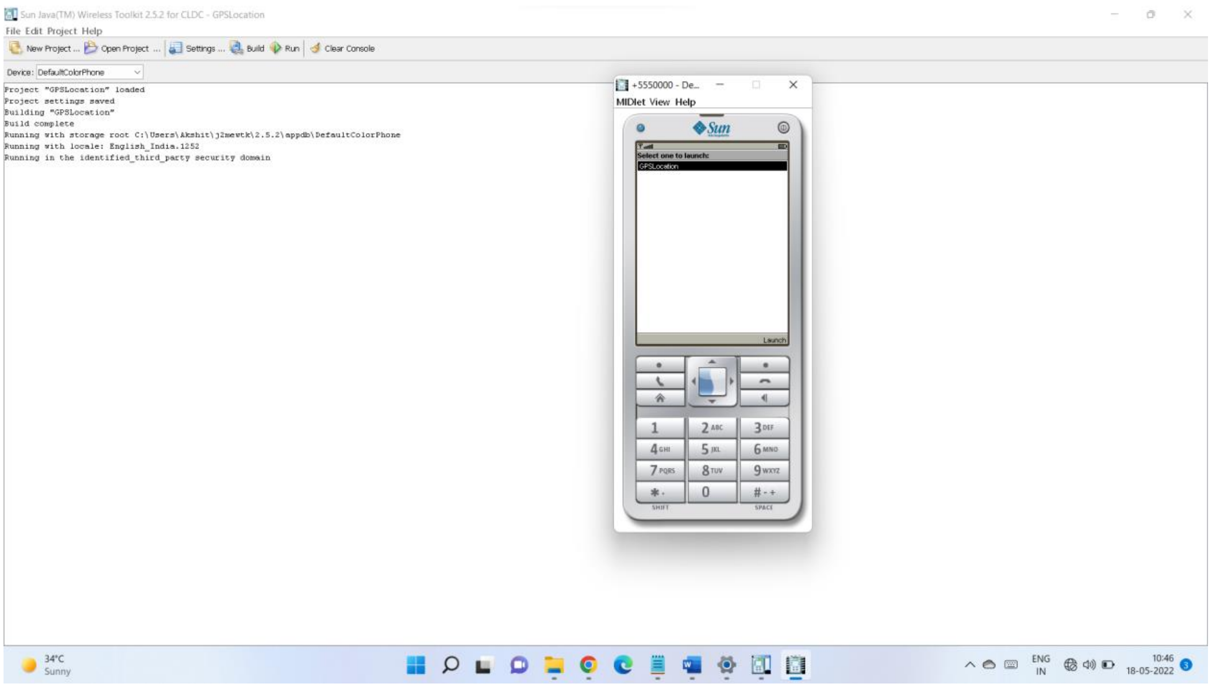
Develop a native application that uses GPS location information.

```
import java.util.*;
import javax.microedition.location.*;
import javax.microedition.midlet.*;
import javax.microedition.lcdui.*;

public class GPSLocation extends MIDlet implements CommandListener
{
 private Display disp;
 private Form form;
 private Alert posAlert;
 private TextField tf1, tf2;

 // Command
 static final Command exit = new Command("Exit", Command.STOP, 2);

 public GPSLocation()
 {
   form = new Form("GPS Location");
 }

 public void startApp()
 {
   disp = Display.getDisplay(this);

   Criteria criteria = new Criteria();

   criteria.setCostAllowed(true);

   criteria.setPreferredPowerConsumption(Criteria.NO_REQUIREMENT);
```

```
LocationProvider provider = null;

double latitude;
double longitude;

try
{
  provider = LocationProvider.getInstance(criteria);

  Location location = provider.getLocation(60);
  Coordinates c = location.getQualifiedCoordinates();

  if(c != null)
  {
    double temp1 = c.getLatitude();
    double temp2 = c.getLongitude();

    String lat = String.valueOf(temp1);
    String lon = String.valueOf(temp2);

    tf1 = new TextField("Latitude", lat, 30, TextField.UNEDITABLE);
    tf2 = new TextField("Longitude", lon, 30, TextField.UNEDITABLE);

    form.append(tf1);
    form.append(tf2);
  }

  else
  {
    posAlert = new Alert("Location Error!!! Null Coordinates Received");
```

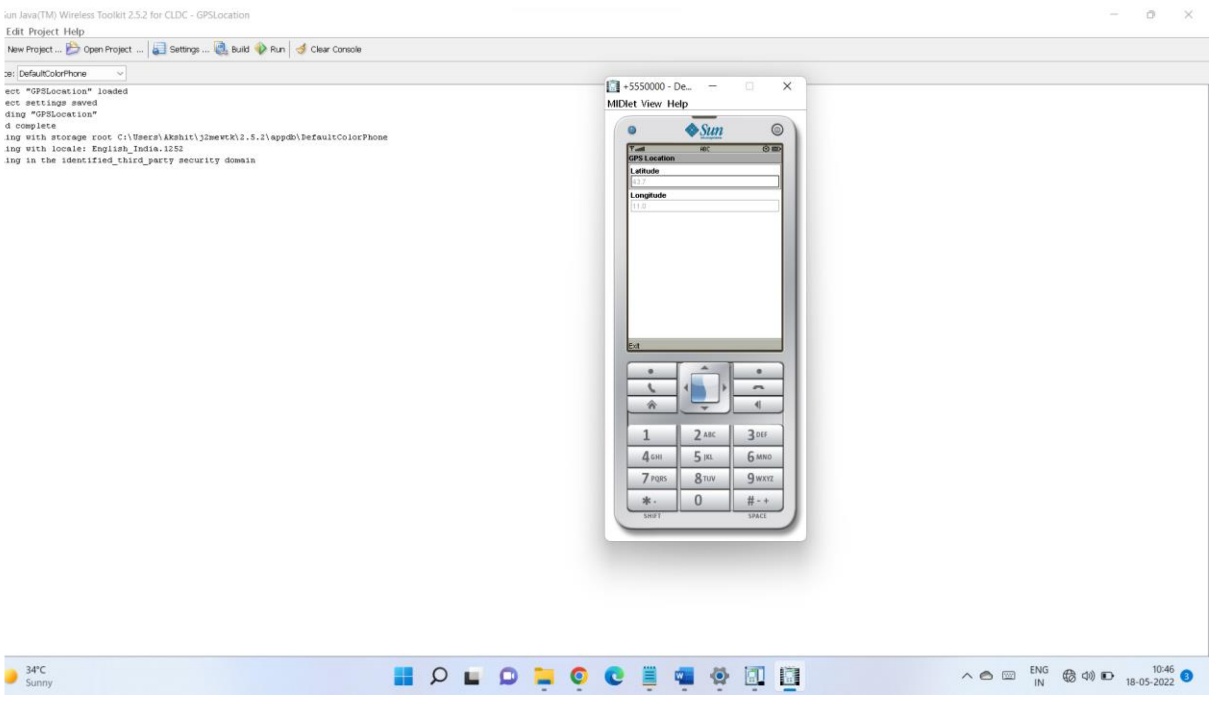
```
      posAlert.setTimeout(Alert.FOREVER);
     }
   }

   catch(LocationException e)
   {
     System.out.println(e.getMessage());
     e.printStackTrace();
   }

   catch(InterruptedException e)
   {
     System.out.println(e.getMessage());
     e.printStackTrace();
   }

   form.addCommand(exit);
   form.setCommandListener(this);

   disp.setCurrent(form);
 }

 public void pauseApp()
 {
   disp = null;
   form = null;
   posAlert = null;

   tf1 = null;
   tf2 = null;
```

```
}

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

public void commandAction(Command c, Displayable displayable)
{
  String label = c.getLabel();

  if(label.equals("Exit"))
  {
    destroyApp(true);
  }
}
}
```



```
Project "GPSLocation" loaded
Project settings saved
Building "GPSLocation"
Build complete
Running with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
Running with locale: English_India.1252
Running in the identified_third_party security domain
```

Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - GPSLocation
File Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
Device: DefaultColorPhone
+5550000 - De...
MIDlet View Help
Select one to launch:
GPSLocation
Launch


Sun Java(TM) Wireless Toolkit 2.5.2 for CLDC - GPSLocation
Edit Project Help
New Project ... Open Project ... Settings ... Build Run Clear Console
DefaultColorPhone
+5550000 - De...
MIDlet View Help
Exit
34°C
Sunny
ENG
IN
10:46
18-05-2022

```
ect "GPSLocation" loaded
ect settings saved
ding "GPSLocation"
d complete
ing with storage root C:\Users\Akshit\j2mewtk\2.5.2\appdb\DefaultColorPhone
ing with locale: English_India.1252
ing in the identified_third_party security domain
```

GPS Location

Latitude: 43.7

Longitude: 11.0