

Department of Computer Science and Engineering

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UCS1711 - Mobile Application Development Lab

Exercise 5: Android Application Development using Multithreading

Objective:

Create an android application to simulate an alarm clock.

Code:

Main Activity:

Design:

```

1 <?xml version="1.0" encoding="utf-8"?>
2 <!--<androidx.constraintlayout.widget.ConstraintLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   -->
3 <!--     xmlns:app="http://schemas.android.com/apk/res-auto"--
   >
4 <!--     xmlns:tools="http://schemas.android.com/tools"-->
5 <!--     android:layout_width="match_parent"-->
6 <!--     android:layout_height="match_parent"-->
7 <!--     tools:context=".MainActivity"-->
8
9 <!--     <TextView-->
10 <!--         android:layout_width="wrap_content"-->
11 <!--         android:layout_height="wrap_content"-->
12 <!--         android:text="Hello World!"-->
13 <!--         app:layout_constraintBottom_toBottomOf="parent"--
   >
14 <!--         app:layout_constraintLeft_toLeftOf="parent"-->
15 <!--         app:layout_constraintRight_toRightOf="parent"-->
16 <!--         app:layout_constraintTop_toTopOf="parent" />-->
17
18 <!--</androidx.constraintlayout.widget.ConstraintLayout-->
19 <RelativeLayout
20     xmlns:android="http://schemas.android.com/apk/res/
   android"
21     xmlns:app="http://schemas.android.com/apk/res-auto"
22     xmlns:tools="http://schemas.android.com/tools"
23     android:layout_width="match_parent"
24     android:layout_height="match_parent"
25     tools:context=".MainActivity">
26
27     <TimePicker
28         android:id="@+id/alarmtime"
29         android:layout_width="match_parent"
30         android:layout_height="wrap_content"
31         android:layout_alignParentStart="true"
32         android:layout_alignParentTop="true"
33         android:layout_marginTop="162dp" />
34
35     <Button
36         android:id="@+id/progbarpage"
37         android:layout_width="121dp"
38         android:layout_height="wrap_content"
39         android:layout_alignParentEnd="true"
40         android:layout_alignParentRight="true"

```

```

41         android:layout_alignParentBottom="true"
42         android:layout_marginEnd="85dp"
43         android:layout_marginRight="85dp"
44         android:layout_marginBottom="77dp"
45         android:onClick="nextPage"
46         android:text="Progress Bar" />
47 </RelativeLayout>

```

Behaviour:

```

1
2 package com.example.multithreading;
3
4 import androidx.annotation.RequiresApi;
5 import androidx.appcompat.app.AppCompatActivity;
6
7 import android.app.AlarmManager;
8 import android.app.PendingIntent;
9 import android.app.TimePickerDialog;
10 import android.content.Intent;
11 import android.os.Build;
12 import android.os.Bundle;
13 import android.view.View;
14 import android.widget.TimePicker;
15 import android.widget.Toast;
16
17 import java.util.Calendar;
18
19 public class MainActivity extends AppCompatActivity {
20
21     Calendar calendar;
22     @Override
23     protected void onCreate(Bundle savedInstanceState) {
24         super.onCreate(savedInstanceState);
25         setContentView(R.layout.activity_main);
26
27         final TimePicker alarm_time = findViewById(R.id.
alarmtime);
28
29         final AlarmManager alarmMgr = (AlarmManager)
getSystemService(ALARM_SERVICE);
30         final Intent I = new Intent(getApplicationContext(),
Alarm.class);
31

```

```

32         final PendingIntent pd = PendingIntent.getBroadcast(
getApplicationContext(), 0, I, 0);
33
34         calendar = Calendar.getInstance();
35         alarm_time.setOnClickListener(new View.
OnClickListener() {
36             @Override
37             public void onClick(View v) {
38                 new TimePickerDialog(MainActivity.this, new
TimePickerDialog.OnTimeSetListener() {
39                     @RequiresApi(api = Build.VERSION_CODES.
KITKAT)
40                     @Override
41
42                     public void onTimeSet(TimePicker view,
int hourOfDay, int minute) {
43                         alarm_time.setHour(hourOfDay);
44                         alarm_time.setMinute(minute);
45
46                         calendar.set(Calendar.HOUR_OF_DAY,
alarm_time.getCurrentHour());
47                         calendar.set(Calendar.MINUTE,
alarm_time.getCurrentMinute());
48
49                         alarmMgr.setExact(AlarmManager.
RTC_WAKEUP, calendar.getTimeInMillis(), pd);
50                         Toast.makeText(MainActivity.this, "
Alarm set", Toast.LENGTH_SHORT).show();
51                     }
52                     }, calendar.get(Calendar.HOUR_OF_DAY),
calendar.get(Calendar.MINUTE), false).show();
53                 }
54             });
55         }
56
57         public void nextPage(View view){
58             Intent intent = new Intent(this, ProgressBarActivity.
class);
59             startActivity(intent);
60         }
61     }

1 package com.example.multithreading;
2
3 import android.app.NotificationManager;

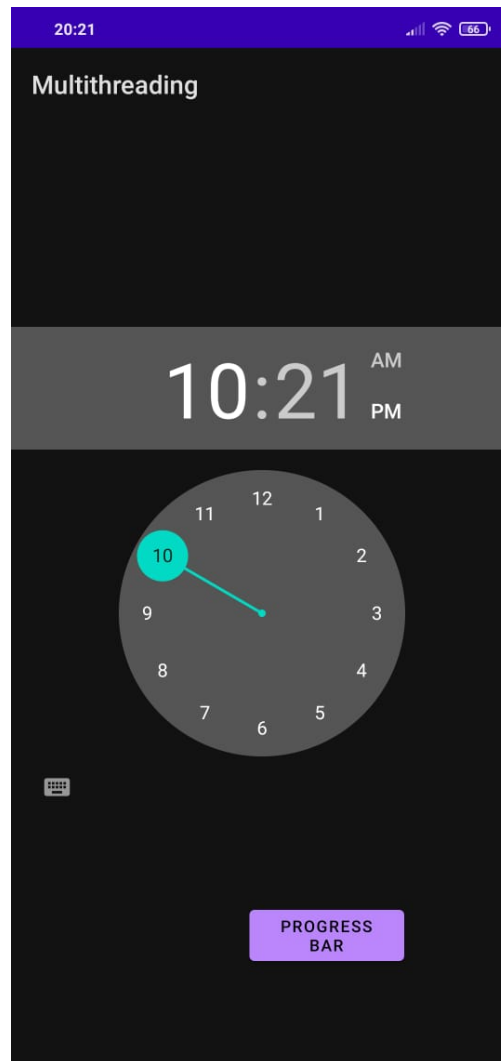
```

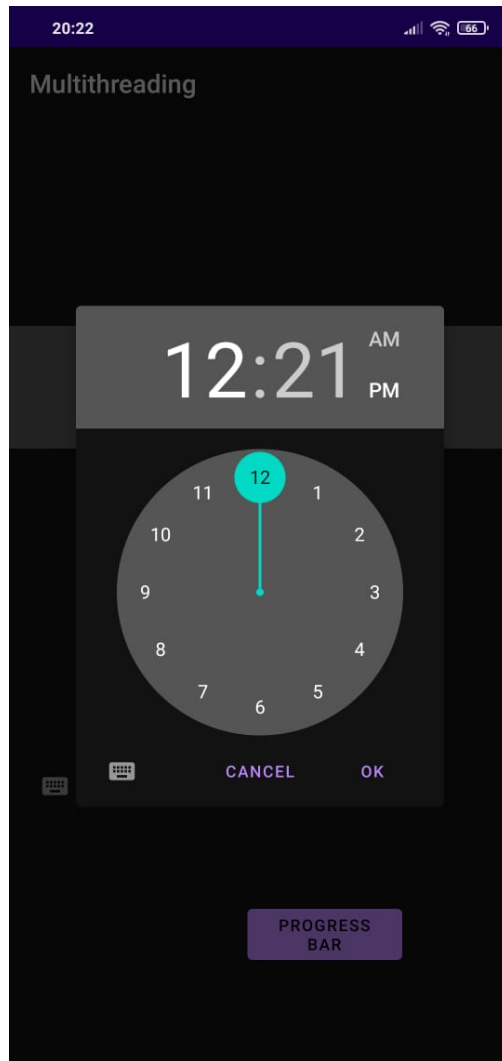
```

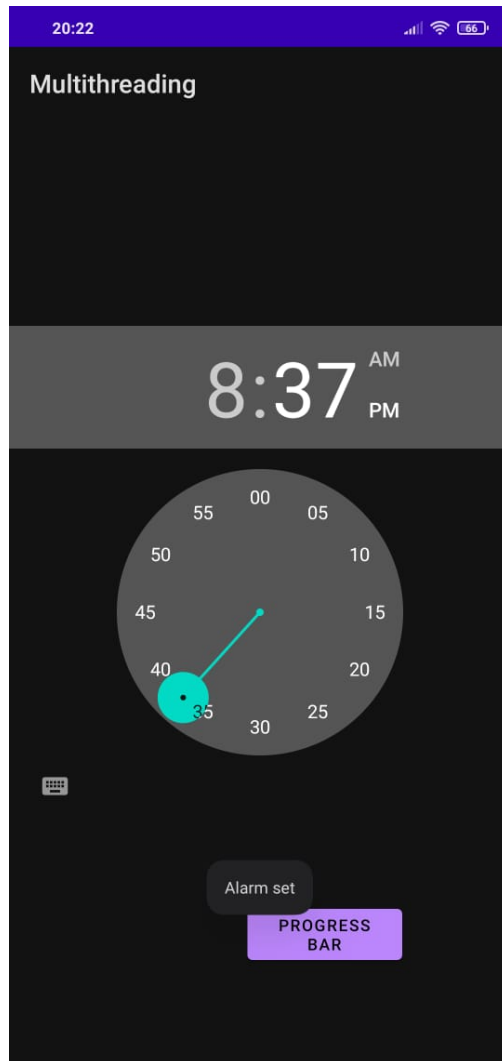
4 import android.app.PendingIntent;
5 import android.content.BroadcastReceiver;
6 import android.content.Context;
7 import android.content.Intent;
8 import android.media.Ringtone;
9 import android.media.RingtoneManager;
10 import android.net.Uri;
11
12 import androidx.core.app.NotificationCompat;
13
14 public class Alarm extends BroadcastReceiver {
15
16     @Override
17     public void onReceive(Context context, Intent intent) {
18         Uri uri = RingtoneManager.getDefaultUri(
19             RingtoneManager.TYPE_ALARM);
20         Ringtone ringtone = RingtoneManager.getRingtone(
21             context, uri);
22         ringtone.play();
23
24         PendingIntent pd = PendingIntent.getActivity(context,
25             0, intent, 0);
26         NotificationCompat.Builder builder = new
27             NotificationCompat.Builder(context, " Wake up ");
28
29         builder.setSmallIcon(R.mipmap.ic_launcher_round);
30         builder.setContentIntent(pd);
31         builder.setContentTitle("Alarm");
32         builder.setContentText("Time up");
33
34         NotificationManager notifmgr = (NotificationManager)
35             context.getSystemService(Context.NOTIFICATION_SERVICE);
36         notifmgr.notify(1, builder.build());
37     }
38 }

```

Output:







Objective:

Create an android application to simulate a progress bar.

Code:

Main Activity:

Design:

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <!--<androidx.constraintlayout.widget.ConstraintLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   -->
3 <!-- xmlns:app="http://schemas.android.com/apk/res-auto"--
   >
4 <!-- xmlns:tools="http://schemas.android.com/tools"-->
5 <!-- android:layout_width="match_parent"-->
6 <!-- android:layout_height="match_parent"-->
7 <!-- tools:context=".ProgressBarActivity">-->
8
9 <!--</androidx.constraintlayout.widget.ConstraintLayout>-->
10
11 <RelativeLayout xmlns:android="http://schemas.android.com/apk
   /res/android"
12     xmlns:app="http://schemas.android.com/apk/res-auto"
13     xmlns:tools="http://schemas.android.com/tools"
14     android:layout_width="match_parent"
15     android:layout_height="match_parent"
16     tools:context=".ProgressBarActivity">
17
18     <EditText
19         android:id="@+id/time_limit"
20         android:layout_width="match_parent"
21         android:layout_height="wrap_content"
22         android:hint="time(in sec)"
23         android:inputType="number"/>
24     <Button
25         android:id="@+id/suspend_button"
```

```

26         android:layout_width="wrap_content"
27         android:layout_height="wrap_content"
28         android:layout_below="@id/time_limit"
29         android:text="SUSPEND"
30         android:layout_centerHorizontal="true"/>
31     <ProgressBar
32         android:id="@+id/progress_bar"
33         android:layout_width="match_parent"
34         android:layout_height="wrap_content"
35         android:layout_below="@id/suspend_button"
36         android:layout_marginLeft="50dp"
37         android:layout_marginRight="50dp"
38         style="@style/Widget.AppCompat.ProgressBar.Horizontal"
39     </ProgressBar>
40     <Button
41         android:id="@+id/start_button"
42         android:layout_width="wrap_content"
43         android:layout_height="wrap_content"
44         android:layout_below="@id/progress_bar"
45         android:text="START"
46         android:layout_centerHorizontal="true"/>
47 </RelativeLayout>

```

Behaviour:

```

1 package com.example.multithreading;
2
3 import androidx.annotation.RequiresApi;
4 import androidx.appcompat.app.AppCompatActivity;
5
6 import android.app.ProgressDialog;
7 import android.content.Intent;
8 import android.content.res.ColorStateList;
9 import android.graphics.Color;
10 import android.os.Build;
11 import android.os.Bundle;
12 import android.os.Handler;
13 import android.view.View;
14 import android.widget.Button;
15 import android.widget.EditText;
16 import android.widget.ProgressBar;
17
18 public class ProgressBarActivity extends AppCompatActivity {
19

```

```

20     ProgressBar pb;
21     Handler handle;
22     int i;
23     @Override
24     protected void onCreate(Bundle savedInstanceState) {
25         super.onCreate(savedInstanceState);
26         setContentView(R.layout.activity_progress_bar);
27
28         Intent intent = getIntent();
29
30         Button suspend_btn = findViewById(R.id.suspend_button
31 );
32         final Button start_btn = findViewById(R.id.
33 start_button);
34
35         pb = findViewById(R.id.progress_bar);
36         handle = new Handler();
37
38         suspend_btn.setOnClickListener(new View.
39 OnClickListener() {
40             @Override
41             public void onClick(View v) {
42                 final ProgressDialog pd = new ProgressDialog(
43 ProgressBarActivity.this);
44                 pd.setTitle("Suspended");
45                 pd.setMessage("Started");
46                 pd.show();
47
48                 EditText time_limit = findViewById(R.id.
49 time_limit);
50                 int limit = Integer.parseInt(time_limit.
51 getEditableText().toString());
52
53                 new Handler().postDelayed(new Runnable() {
54                     @Override
55                     public void run() {
56                         pd.dismiss();
57                     }
58                 }, limit*1000);
59             }
60         });
61
62         start_btn.setOnClickListener(new View.OnClickListener
63 () {
64             @Override

```

```

58         public void onClick(View v) {
59             new Thread(new Runnable() {
60                 @Override
61                 public void run() {
62                     for(i=0;i<100;i+=10){
63                         if(i==100){
64                             handle.post(new Runnable() {
65                                 @RequiresApi(api = Build.
VERSION_CODES.LOLLIPOP)
66                                     @Override
67                                     public void run() {
68                                         pb.
setProgressTintList(ColorStateList.valueOf(Color.RED));
69                                         start_btn.setText("
FINISH");
70                                     }
71                                 });
72                             }
73                             pb.setProgress(i);
74                             try{
75                                 Thread.sleep(100);
76                             }
77                             catch (Exception e){
78                                 e.printStackTrace();
79                             }
80                         }
81                     }
82                 }).start();
83             }
84         });
85     }
86 }
87 }

```

Output:

