Lecture 6

User Interface

Basic views, Picker views, List views

Course: **Mobile App Development**

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User Interface

- Basic views: Commonly used views, such as the TextView, EditText, and Button views
- Picker views: Views that enable users to select from a list, such as the TimePicker and DatePicker views
- List views: Views that display a long list of items, such as the ListView and the SpinnerView views

Basic views

- TextView — to display text to the user
- EditText —A subclass of the TextView view, which allows users to edit its text content
- Button—Represents a push-button widget
- ImageButton—Similar to the Button view, except that it also displays an image
- CheckBox—A special type of button that has two states: checked or unchecked
- RadioGroup and RadioButton—The RadioButton has two states: either checked or unchecked. A RadioGroup is used to group one or moreRadioButtonviews, thereby allowing only one RadioButton to be checked within the RadioGroup
- ToggleButton—Displays checked/unchecked states using a light indicator

Basic views

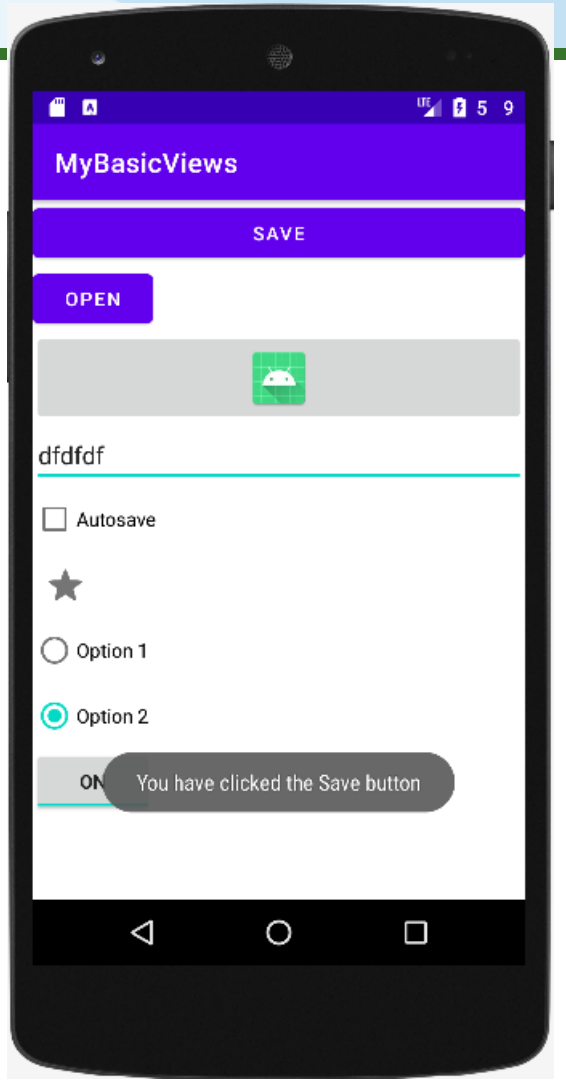
- One thing that has been consistent throughout this example is that each view has the id attribute set to a particular value, such as in the case of the Button
- The **id** attribute is an identifier for a view, which allows it to **be retrieved** using the View.**findViewById()** or Activity.findViewById() methods

```
<Button android:id="@+id/btnSave"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="@string/save" />
```

Using basic views

- Using Android Studio, create an Android project and name it BasicViews
- Replace the **activity_main.xml** with the following:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"    android:layout_height="match_parent"
   android:orientation="vertical“       tools:context=".MainActivity">
   <Button android:id="@+id/btnSave"
      android:layout_width="fill_parent"
      android:layout_height="wrap_content"       android:text="save" />
   <Button android:id="@+id/btnOpen"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content“       android:text="Open" />
   <ImageButton android:id="@+id/btnImg1"
      android:layout_width="fill_parent"
      android:layout_height="wrap_content“       android:src="@mipmap/ic_launcher" />
```



Using basic views ..

- activity_main.xml …

```
<EditText android:id="@+id/txtName"
   android:layout_width="fill_parent"
   android:layout_height="wrap_content" />
<CheckBox android:id="@+id/chkAutosave"
   android:layout_width="fill_parent"
   android:layout_height="wrap_content"
   android:text="Autosave" />
<CheckBox android:id="@+id/star"
   style="?android:attr/starStyle"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content" />
```

```
<RadioGroup android:id="@+id/rdbGp1"
     android:layout_width="fill_parent"
     android:layout_height="wrap_content"
     android:orientation="vertical" >
     <RadioButton android:id="@+id/rdb1"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Option 1" />
     <RadioButton android:id="@+id/rdb2"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Option 2" />
  </RadioGroup>
  <ToggleButton android:id="@+id/toggle1"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content" />
</LinearLayout>
```

Using basic views

- Modify **MainActivity.java** (add bolded lines):

```
package com.maicuongtho.mybasicviews;
import ….
….
public class MainActivity extends AppCompatActivity {

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      //---Button view---
      Button btnOpen = (Button) findViewById(R.id.btnOpen);
      btnOpen.setOnClickListener(new View.OnClickListener() {
         public void onClick(View v) {
            DisplayToast("You have clicked the Open button");
         }
      });
```

```
//---Button view---
Button btnSave = (Button) findViewById(R.id.btnSave);
btnSave.setOnClickListener(new View.OnClickListener() {
   public void onClick(View v) {
      DisplayToast("You have clicked the Save button");
   }
});
//---CheckBox---
CheckBox checkBox = (CheckBox) findViewById(R.id.chkAutosave);
checkBox.setOnClickListener(new View.OnClickListener() {
   public void onClick(View v) {
      if (((CheckBox)v).isChecked())
         DisplayToast("CheckBox is checked");
      else
         DisplayToast("CheckBox is unchecked");
   }
});
```

Using basic views

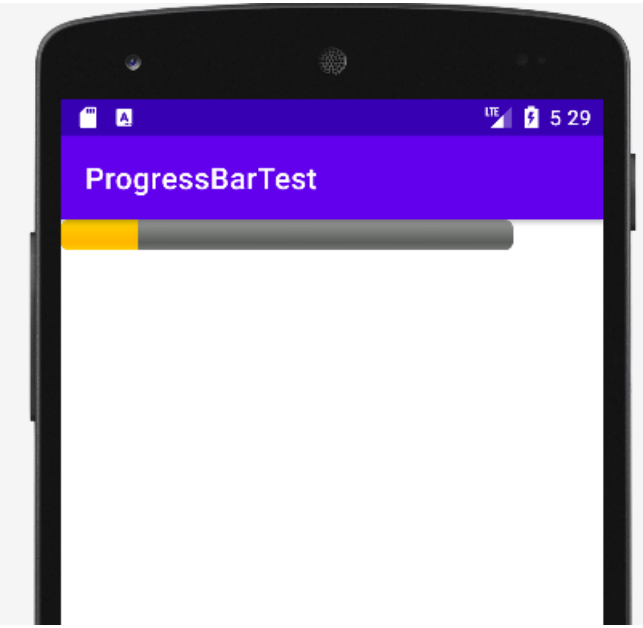
```
//---RadioButton---
RadioGroup radioGroup = (RadioGroup) findViewById(R.id.rdbGp1);
radioGroup.setOnCheckedChangeListener(
      new RadioGroup.OnCheckedChangeListener() {
         public void onCheckedChanged(RadioGroup group, int checkedId) {
            RadioButton rb1 = (RadioButton) findViewById(R.id.rdb1);
            if (rb1.isChecked()) {
               DisplayToast("Option 1 checked!");
            } else {
               DisplayToast("Option 2 checked!");
            }
         }
      });
```

```
private void DisplayToast(String msg)
  {
   Toast.makeText(getBaseContext(),
msg,Toast.LENGTH_SHORT).show();

  }
```

```
//---ToggleButton---
ToggleButton toggleButton = (ToggleButton) findViewById(R.id.toggle1);
toggleButton.setOnClickListener(new View.OnClickListener() {
   public void onClick(View v) {
      if (((ToggleButton)v).isChecked())
         DisplayToast("Toggle button is On");
      else
         DisplayToast("Toggle button is Off");
   }
});
```

ProgressBar view

- The ProgressBar view provides visual feedback about some ongoing tasks, such as when you are performing a task in the background
- Using Android Studio, create an Android project and name it ProgressBarTest
- Change activity_main.xml:

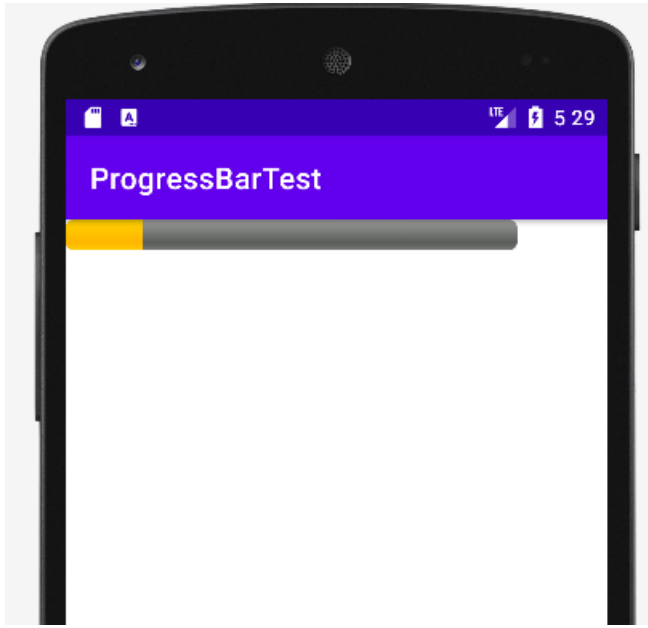



```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   tools:context=".MainActivity">
   <ProgressBar android:id="@+id/progressbar"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      style="@android:style/Widget.ProgressBar.Horizontal" />
</LinearLayout>
```

ProgressBar view

- Change MainActivity.java

```
package com.maicuongtho.progressbartest;
……
public class MainActivity extends AppCompatActivity {
    static int progress;
    ProgressBar progressBar;
    int progressStatus = 0;
    Handler handler = new Handler();
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        progress = 0;
        progressBar = (ProgressBar) findViewById(R.id.progressbar);
        progressBar.setMax(200); // default is 100
```



ProgressBar view

```
//---do some work in background thread---
new Thread(new Runnable() {
   public void run() {
      //---do some work here---
      while (progressStatus < 100)
      {
         progressStatus = doSomeWork();
         //---Update the progress bar---
         handler.post(new Runnable()
         {
            public void run() {
               progressBar.setProgress(progressStatus);
            }
         });
      } // end while
}
```

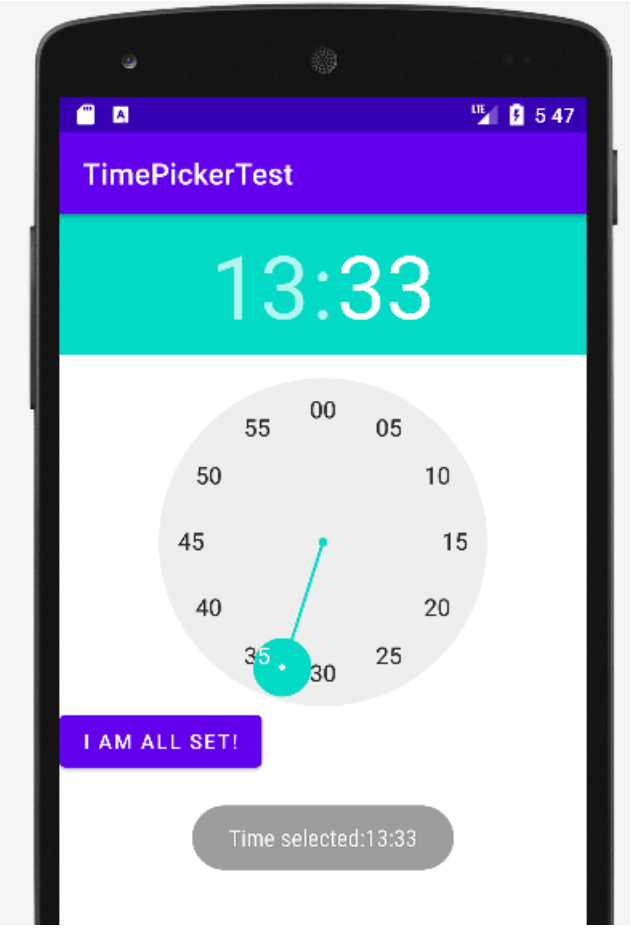
```
 //---hides the progress bar---
      handler.post(new Runnable() {
         public void run() {
            //---0 - VISIBLE; 4 - INVISIBLE; 8 - GONE---
            progressBar.setVisibility(View.GONE);
         }
      });
//---do some long running work here---
   private int doSomeWork() {
      try {
         //---simulate doing some work---
         Thread.sleep(500);
      } catch (InterruptedException e) {
         e.printStackTrace();
      }
      return ++progress;
   }
}).start();
```

ProgressBar Styles

- Widget.ProgressBar.Horizontal
- Widget.ProgressBar.Small
- Widget.ProgressBar.Large
- Widget.ProgressBar.Inverse
- Widget.ProgressBar.Small.Inverse
- Widget.ProgressBar.Large.Inverse

Picker Views

- **TimePicker** and DatePicker views: select a data and time
- The TimePicker view enables users to select a time of the day, in either 24-hour mode or AM/PM mode
- Using Android Studio, create an Android project and name it **TimePickerTest**
- Modify activity_main.xml



TimePicker Views

- Modify MainActivity.java

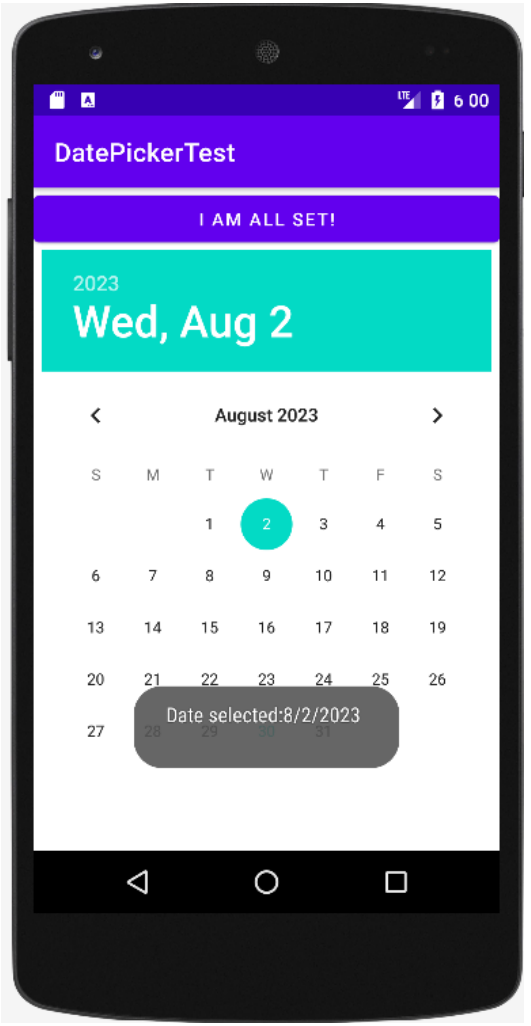
```
package com.maicuongtho.timepickertest;
…
public class MainActivity extends AppCompatActivity {
   TimePicker timePicker;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);

      timePicker = (TimePicker) findViewById(R.id.timePicker);
      timePicker.setIs24HourView(true);
   }
}
```

```
public void onClick(View view) {
      Toast.makeText(getBaseContext(),
            "Time selected:" +
                  timePicker.getHour() +
                  ":" + timePicker.getMinute(),
            Toast.LENGTH_SHORT).show();
   }
```

DatePicker Views

- Using Android Studio, create an Android project and name it **DatePickerTest**
- Modify activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="fill_parent“
 android:layout_height="fill_parent"
   android:orientation="vertical" >
   <Button android:id="@+id/btnSet"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="I am all set!"
      android:onClick="onClick" />
   <DatePicker android:id="@+id/datePicker"
      android:layout_gravity="center"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content" />
</LinearLayout>
```



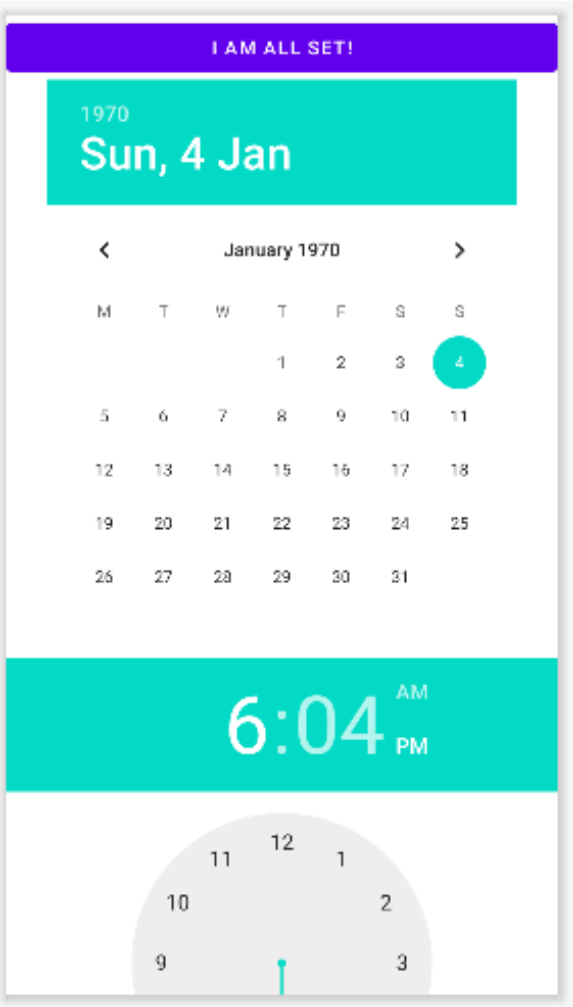
DatePicker Views

- Modify MainActivity.java

```
package com.maicuongtho.datepickertest;
....
public class MainActivity extends AppCompatActivity {
  DatePicker datePicker;
  @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      ///
      datePicker = (DatePicker) findViewById(R.id.datePicker);
   }
   public void onClick(View view) {
      Toast.makeText(getBaseContext(),
            "Date selected:" + (datePicker.getMonth() + 1) +
                  "/" + datePicker.getDayOfMonth() +
                  "/" + datePicker.getYear() + "\n",
            Toast.LENGTH_SHORT).show();
   }
}
```

Combine: DatePicker & TimePicker

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:orientation="vertical" >
   <Button android:id="@+id/btnSet"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="I am all set!"
      android:onClick="onClick" />
   <DatePicker android:id="@+id/datePicker"
      android:layout_gravity="center"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content" />
   <TimePicker android:id="@+id/timePicker"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content" />
</LinearLayout>
```



Combine

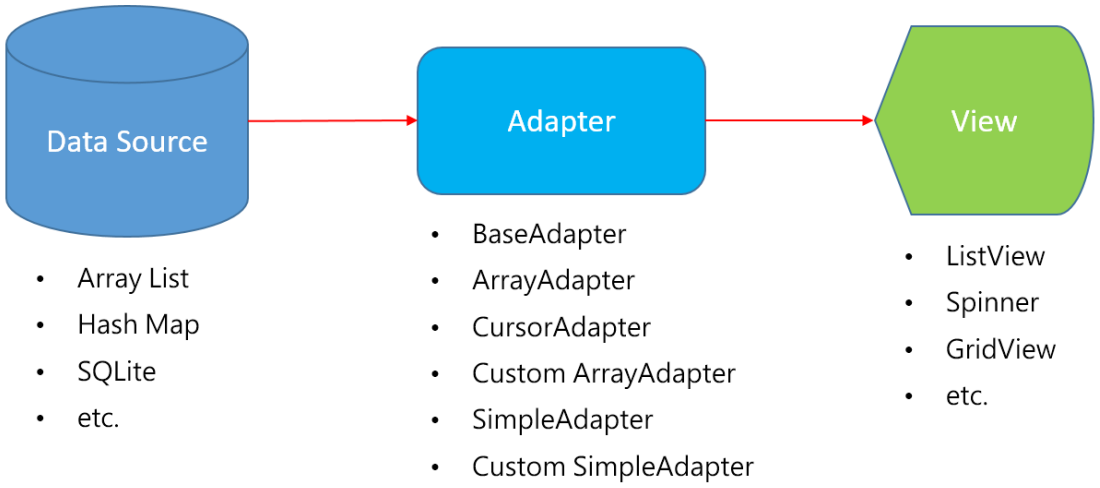
```
package com.maicuongtho.datepickertest;
.....

public class MainActivity extends AppCompatActivity {
    TimePicker timePicker;    DatePicker datePicker;
    int hour, minute;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ///
        timePicker = (TimePicker) findViewById(R.id.timePicker);
        timePicker.setIs24HourView(true);
        datePicker = (DatePicker) findViewById(R.id.datePicker);
    }
```

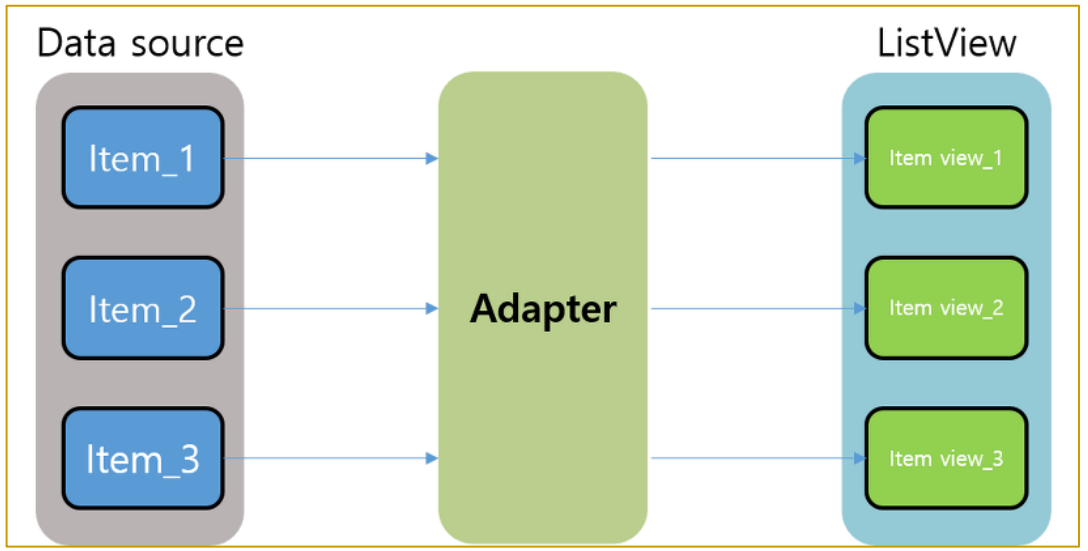
```
private TimePickerDialog.OnTimeSetListener mTimeSetListener =
        new TimePickerDialog.OnTimeSetListener() {
            public void onTimeSet(
                    TimePicker view, int hourOfDay, int minuteOfHour) {
                hour = hourOfDay; minute = minuteOfHour;
                SimpleDateFormat timeFormat = new SimpleDateFormat("hh:mm aa");
                Date date = new Date(); String strDate = timeFormat.format(date);
                Toast.makeText(getBaseContext(),
                        "You have selected " + strDate,
                        Toast.LENGTH_SHORT).show();
            }
        };
}
```

```
public void onClick(View view) {
    Toast.makeText(getBaseContext(),
            "Date selected:" + (datePicker.getMonth() + 1) +
                    "/" + datePicker.getDayOfMonth() +
                    "/" + datePicker.getYear() + "\n" +
                    "Time selected:" + timePicker.getHour() +
                    ":" + timePicker.getMinute(),
            Toast.LENGTH_SHORT).show();
}
```

ListView

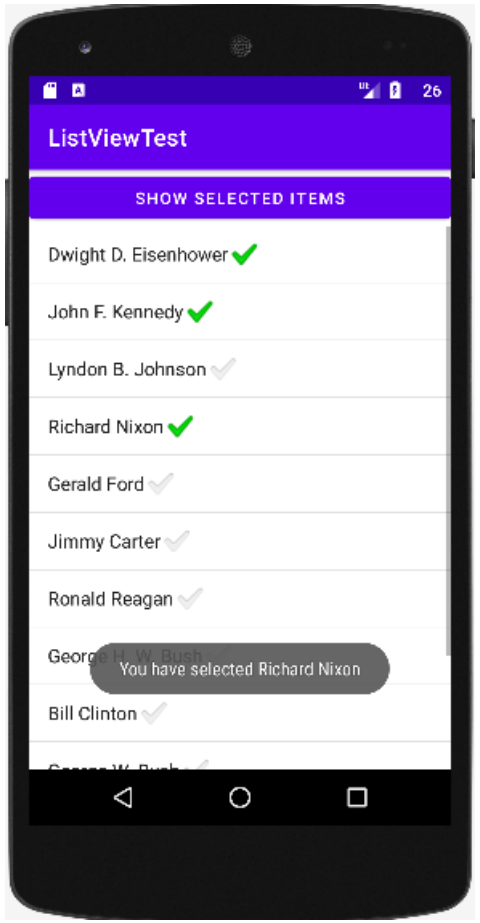
- List views are views that enable you to display a long list of items. In Android, there are two types of list views: ListView and SpinnerView.

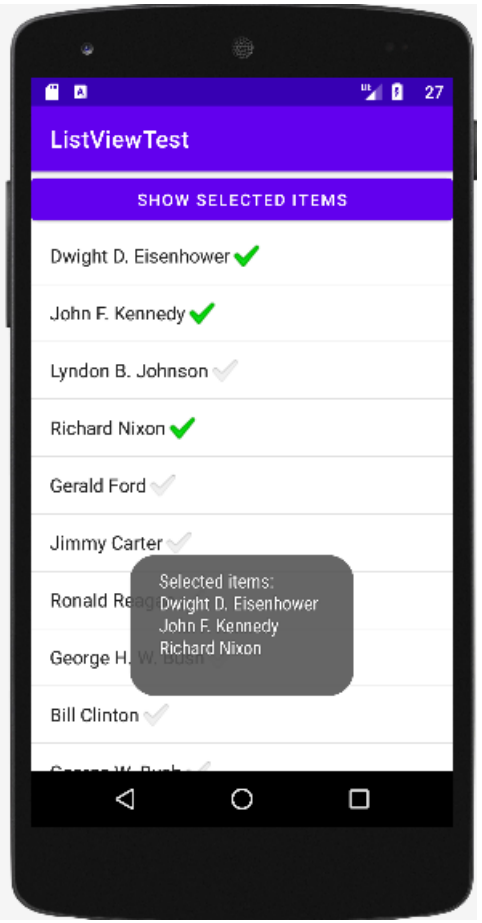




ListView

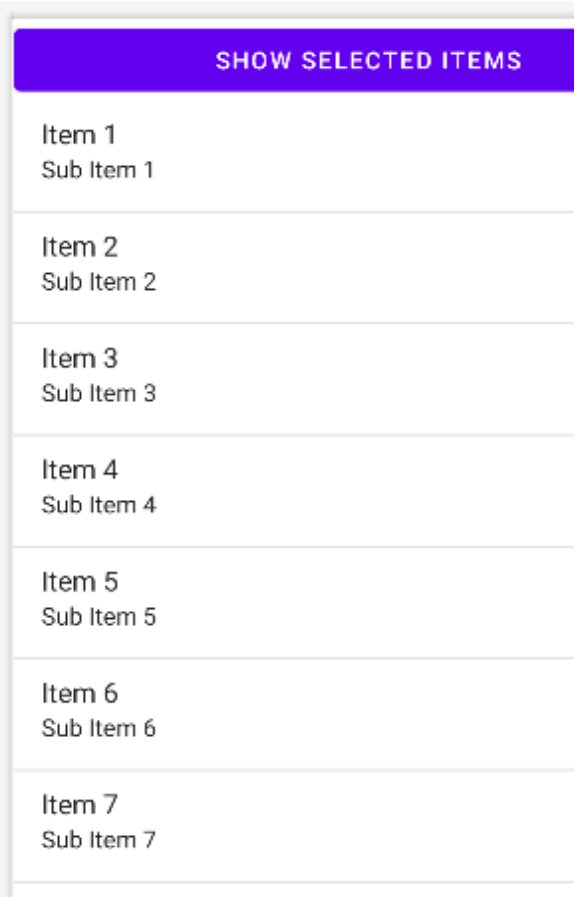
- Using Android Studio, create an Android project and name it **ListViewTest**





ListView

- Modify activity_main.xml




```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:orientation="vertical" >
   <Button
      android:id="@+id/btn"
      android:layout_width="fill_parent"
      android:layout_height="wrap_content"
      android:text="Show selected items"
      android:onClick="onClick"/>
   <ListView
      android:id="@+id/listView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content" />
</LinearLayout>
```

ListView

- Modify strings.xml under res/values

```
<resources>
    <string name="app_name">ListViewTest</string>
    <string-array name="presidents_array">
        <item>Dwight D. Eisenhower</item>
        <item>John F. Kennedy</item>
        <item>Lyndon B. Johnson</item>
        <item>Richard Nixon</item>
        <item>Gerald Ford</item>
        <item>Jimmy Carter</item>
        <item>Ronald Reagan</item>
        <item>George H. W. Bush</item>
        <item>Bill Clinton</item>
        <item>George W. Bush</item>
        <item>Barack Obama</item>
        <item>Donald Trump</item>
    </string-array>
</resources>
```

we can create this array of strings in MainActivity.java

ListView

- Modify MainActivity.java

```
package com.maicuongtho.listviewtest;
…
public class MainActivity extends AppCompatActivity {
   String[] presidents;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      //================
      ListView lstView = findViewById(R.id.androidList);
      lstView.setChoiceMode(ListView.CHOICE_MODE_MULTIPLE);
      lstView.setTextFilterEnabled(true);
      presidents = getResources().getStringArray(R.array.presidents_array);
      lstView.setAdapter(   new ArrayAdapter<String>(
                                    this,
                                   android.R.layout.simple_list_item_checked,
                                    presidents));
```

ListView

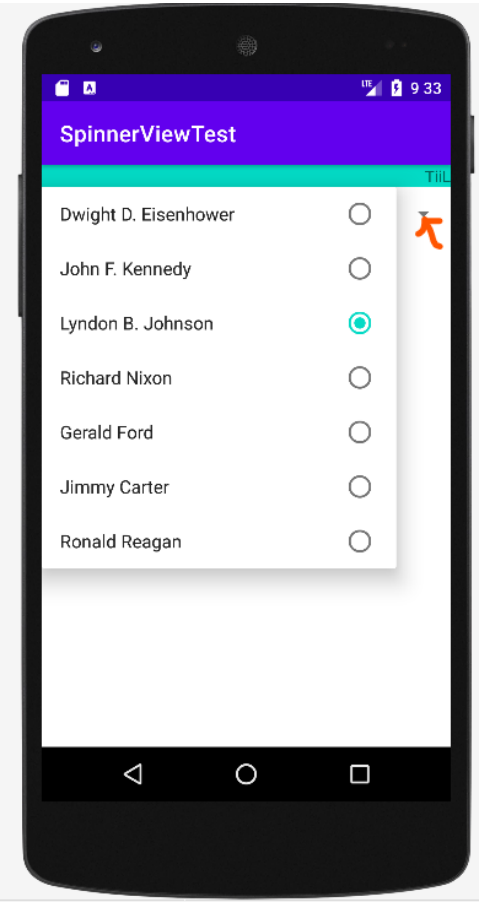
```
lstView.setOnItemClickListener(new AdapterView.OnItemClickListener() {
        @Override
        public void onItemClick(AdapterView<?> adapterView, View view, int position, long id) {
           Toast.makeText(
                        getBaseContext(),
                        "You have selected " +presidents[position] ,
                        Toast.LENGTH_SHORT
                       ).show();
        }
    });
  } // onCreate end
```

```
public void buttonOnClick(View view) {
   ListView lstView = findViewById(R.id.androidList);
   String itemsSelected = "Selected items: \n";
   for (int i=0; i<lstView.getCount(); i++) {
      if (lstView.isItemChecked(i)) {
         itemsSelected += lstView.getItemAtPosition(i) + "\n";
      }
   }
   Toast.makeText(this, itemsSelected, Toast.LENGTH_LONG).show();
}
```

SpinnerView

- The SpinnerView displays one item at a time from a list and enables users to choose from them
- Create an Android project and name it **SpinnerViewTest**
- Modify activity_main.xml

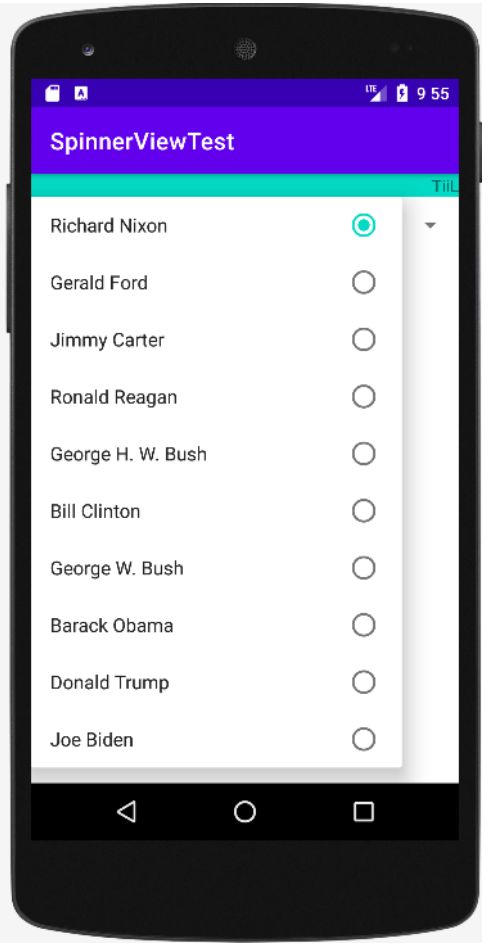
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="fill_parent“              android:layout_height="fill_parent"
   android:orientation="vertical" >
   <TextView
      android:layout_width="match_parent“        android:layout_height="wrap_content"
      android:gravity="right“                    android:background="@color/teal_200"
      android:text="@string/copyrightTiiL"/>
   <Spinner
      android:id="@+id/spinner1"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:drawSelectorOnTop="true" />
</LinearLayout>
```



SpinnerView

- Modify MainActivity.java

```
package com.maicuongtho.spinnerviewtest;
....
public class MainActivity extends AppCompatActivity {
   ArrayList<String> presidents;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      //presidents = getResources().getStringArray(R.array.presidents_array);
      presidents = new ArrayList<String>();
      presidents.add("Richard Nixon");          presidents.add("Gerald Ford");
      presidents.add("Jimmy Carter");           presidents.add("Ronald Reagan");
      presidents.add("George H. W. Bush");      presidents.add("Bill Clinton");
      presidents.add("George W. Bush");         presidents.add("Barack Obama");
      presidents.add("Donald Trump");           presidents.add("Joe Biden");
```



SpinnerView

- Modify MainActivity.java

```
Spinner s1 = (Spinner) findViewById(R.id.spinner1);
   ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,  android.R.layout.simple_list_item_single_choice,
                                                                  presidents);
   s1.setAdapter(adapter);
   s1.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
      @Override
      public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {
         int index = adapterView.getSelectedItemPosition();
         Toast.makeText(getBaseContext(),
                        "You have selected item : " + presidents.get(index),
                        Toast.LENGTH_SHORT
                        ).show();
      }
      @Override
      public void onNothingSelected(AdapterView<?> adapterView) {   }
   });
}
```