**Addon programs**

**Example 1 : Recycler View**

**Activity\_main.xml**

***<?*xml version="1.0" encoding="utf-8"*?>*<androidx.constraintlayout.widget.ConstraintLayout  
 xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 xmlns:app="http://schemas.android.com/apk/res-auto"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 tools:context=".MainActivity">  
  
 <androidx.recyclerview.widget.RecyclerView  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:id="@+id/rvFootballTeamInfo"  
 android:scrollbars="vertical">  
  
 </androidx.recyclerview.widget.RecyclerView>  
  
  
  
</androidx.constraintlayout.widget.ConstraintLayout>**

**MainActivity.java**

**package com.example.recyclerviewexample;  
  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.recyclerview.widget.LinearLayoutManager;  
import androidx.recyclerview.widget.RecyclerView;  
  
import android.os.Bundle;  
  
import java.util.ArrayList;  
import java.util.List;  
  
public class MainActivity extends AppCompatActivity {  
 RecyclerView rvTeams;  
 List<Team> teamList = new ArrayList<>();  
 MyAdapter adapter;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 rvTeams = (RecyclerView) findViewById(R.id.*rvFootballTeamInfo*);  
  
 setTeamData();  
  
 adapter = new MyAdapter(teamList);  
 RecyclerView.LayoutManager manager = new LinearLayoutManager(getApplicationContext());  
 rvTeams.setLayoutManager(manager);  
 rvTeams.setAdapter(adapter);  
 }  
  
 private void setTeamData() {  
 Team team = new Team("Manchester United", "English Premier League", 1878);  
 teamList.add(team);  
  
 team = new Team("Arsenal", "English Premier League", 1886);  
 teamList.add(team);  
  
 team = new Team("Liverpool", "English Premier League", 1892);  
 teamList.add(team);  
  
 team = new Team("Juventus", "Serie A", 1897);  
 teamList.add(team);  
  
 team = new Team("Real Madrid", "La Liga", 1902);  
 teamList.add(team);  
  
 team = new Team("Bayern Munich", "Bundesliga", 1900);  
 teamList.add(team);  
  
 team = new Team("PSG", "France Ligue 1", 1970);  
 teamList.add(team);  
  
 team = new Team("Ajax", "Eredivisie", 1900);  
 teamList.add(team);  
  
 team = new Team("jax", "Eredivisie", 1900);  
 teamList.add(team);  
 team = new Team("ax", "Eredivisie", 1900);  
 teamList.add(team);  
 team = new Team("Ajaxdfdf", "Eredivisie", 1900);  
 teamList.add(team);  
 team = new Team("Ajaxfdfgfdg", "Eredivisie", 1900);  
 teamList.add(team);  
 team = new Team("Ajaxdfdfd", "Eredivisie", 1900);  
 teamList.add(team);  
 team = new Team("fsdfAjax", "Eredivisie", 1900);  
 teamList.add(team);  
  
  
 }  
}**

**MyAdapter.java**

**package com.example.recyclerviewexample;  
  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.TextView;  
  
import androidx.recyclerview.widget.RecyclerView;  
  
import java.util.List;  
  
public class MyAdapter extends RecyclerView.Adapter<MyAdapter.ViewHolder> {  
  
 public List<Team> teamList;  
  
 public MyAdapter(List<Team> footballTeamList) {  
 teamList = footballTeamList;  
 }  
  
 public class ViewHolder extends RecyclerView.ViewHolder {  
  
 TextView name, league, yearEstablished;  
  
 public ViewHolder(View itemView) {  
 super(itemView);  
 name = (TextView) itemView.findViewById(R.id.tvName);  
 league = (TextView) itemView.findViewById(R.id.tvLeague);  
 yearEstablished = (TextView) itemView.findViewById(R.id.tvYear);  
 }  
 }  
  
 public MyAdapter.ViewHolder onCreateViewHolder(ViewGroup parent, int viewType) {  
 View view = LayoutInflater.from(parent.getContext()).inflate(R.layout.row, parent, false);  
  
 return new ViewHolder(view);  
 }  
  
 @Override  
 public void onBindViewHolder(MyAdapter.ViewHolder holder, int position) {  
 holder.name.setText(teamList.get(position).getName());  
 holder.league.setText(teamList.get(position).getLeague());  
 holder.yearEstablished.setText(String.valueOf  
 (teamList.get(position).getYearEstablished()));  
 }  
  
 @Override  
 public int getItemCount() {  
 return teamList.size();  
 }  
 }**

***row.xml***

***<?*xml version="1.0" encoding="utf-8"*?>*<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 xmlns:tools="http://schemas.android.com/tools"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:paddingBottom="16dp"  
 android:paddingLeft="16dp"  
 android:paddingRight="16dp"  
 android:paddingTop="16dp">  
  
  
 <TextView  
 android:id="@+id/tvName"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_alignParentTop="true"  
 tools:text="Team Name"  
 android:textSize="20sp"  
 android:textStyle="bold" />  
  
 <TextView  
 android:id="@+id/tvLeague"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 tools:text="Team League"  
 android:layout\_below="@id/tvName" />  
  
 <TextView  
 android:id="@+id/tvYear"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 tools:text="1999"  
 android:layout\_alignParentRight="true"  
 />  
  
</RelativeLayout>**

**Team.java(Model)**

**package com.example.recyclerviewexample;  
  
public class Team {  
  
 private String name;  
 private String league;  
 private int yearEstablished;  
  
 public Team() {  
  
 }  
  
 public Team(String name, String league, int yearEstablished) {  
 this.name = name;  
 this.league = league;  
 this.yearEstablished = yearEstablished;  
 }  
  
 public String getName() {  
 return name;  
 }  
  
 public void setName(String name) {  
 this.name = name;  
 }  
  
 public String getLeague() {  
 return league;  
 }  
  
 public void setLeague(String league) {  
 this.league = league;  
 }  
  
 public int getYearEstablished() {  
 return yearEstablished;  
 }  
  
 public void setYearEstablished(int yearEstablished) {  
 this.yearEstablished = yearEstablished;  
 }  
}**

**Example2: Recycler view with card View example**

**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="wrap\_content"  
 android:orientation="vertical"  
 tools:context=".MainActivity">  
 *<!-- Button to add new android version so that we can see it is working fine with new items -->* <Button  
 android:id="@+id/btadd"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="@string/add" />  
 *<!-- RecyclerView with id ListR to display all content in it -->* <androidx.recyclerview.widget.RecyclerView  
 android:id="@+id/ListR"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content">  
  
 </androidx.recyclerview.widget.RecyclerView>  
  
</LinearLayout>**

**MainActivity.java**

**package com.example.cardview\_recyclerex;  
  
import androidx.annotation.NonNull;  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.recyclerview.widget.ItemTouchHelper;  
import androidx.recyclerview.widget.LinearLayoutManager;  
import androidx.recyclerview.widget.RecyclerView;  
  
import android.os.Bundle;  
import android.view.View;  
import android.widget.Button;  
import android.widget.Toast;  
  
import java.util.ArrayList;  
  
public class MainActivity extends AppCompatActivity implements androidVersionAdapter.ItemClicked {  
  
 RecyclerView recyclerView;  
 RecyclerView.Adapter myAdapter;  
 RecyclerView.LayoutManager layoutManager;  
 ArrayList < androidVersion > people;  
 Button btadd;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 recyclerView = findViewById(R.id.*ListR*);  
 btadd = findViewById(R.id.*btadd*);  
 btadd.setOnClickListener(view -> {  
 people.add(new androidVersion("Android Q", "10.0.0\_r64", "Q"));  
 myAdapter.notifyDataSetChanged();  
 });  
 recyclerView.setHasFixedSize(true);  
 layoutManager = new LinearLayoutManager(this);  
 recyclerView.setLayoutManager(layoutManager);  
 people = new ArrayList < androidVersion > ();  
 people.add(new androidVersion("Cupcake", "1.5", "Cupcake"));  
 people.add(new androidVersion("Donut", "1.6", "donut"));  
 people.add(new androidVersion("Eclair", "2.0-2.1", "eclair"));  
 people.add(new androidVersion("Gingerbread", "2.2-2.3", "gingerbread"));  
 people.add(new androidVersion("Honeycomb", "2.3-3.7", "honeycomb"));  
 people.add(new androidVersion("Ice Cream Sandwich", "3.0-3.2.6", "icecreamsandwich"));  
 people.add(new androidVersion("JellyBean", "4.0-4.3.1", "jellybean"));  
 people.add(new androidVersion("Kitkat", "4.4-4.4.4", "kitkat"));  
 people.add(new androidVersion("Lollipop", "5.0-5.1.1", "lollipop"));  
 people.add(new androidVersion("Marshmallow", "6.0-6.0.1", "marshmallow"));  
  
 myAdapter = new androidVersionAdapter(this, people);  
  
 recyclerView.setAdapter(myAdapter);  
  
 }  
  
 @Override  
 public void onItemClicked(int index) {  
 Toast.*makeText*(this, "Version :" + people.get(index).getVersion(), Toast.*LENGTH\_LONG*).show();  
 }  
}**

**list\_item.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"  
 android:orientation="vertical"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent">  
 *<!-- For implementing the cardView -->* <androidx.cardview.widget.CardView  
 xmlns:card\_view="http://schemas.android.com/apk/res-auto"  
 card\_view:cardBackgroundColor="#FFFF00"  
 card\_view:cardCornerRadius="3dp"  
 card\_view:cardElevation="5dp"  
 card\_view:cardUseCompatPadding="false"  
 android:layout\_margin="7dp"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content">  
 *<!-- A nested Linear Layout inside the cardView with orientation horizonatal -->* <LinearLayout  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:orientation="horizontal">  
 *<!-- ImageView to show icon we picked -->* <ImageView  
 android:id="@+id/ivicon"  
 android:layout\_width="50dp"  
 android:layout\_height="50dp"  
 app:srcCompat="@drawable/ic\_launcher\_foreground" />  
 *<!-- another nested Linear layout with vertical orientation so that we can arrange both textView -->* <LinearLayout  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:layout\_weight="1"  
 android:orientation="vertical">  
 *<!--TextView for displaying name of android-->* <TextView  
 android:id="@+id/tvnam"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="TextView"  
 android:textSize="14sp"  
 android:textStyle="bold" />  
 *<!--TextView for displaying the version of android-->* <TextView  
 android:id="@+id/tvversion"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:text="TextView"  
 android:textSize="14sp"  
 android:textStyle="bold" />  
 </LinearLayout>  
 *<!-- close the innermost linear layout-->* </LinearLayout>  
 *<!-- Close the inner linear layout-->* </androidx.cardview.widget.CardView>  
 *<!-- Close cardView -->*</LinearLayout>**

**androidVersionAdapter.java**

**package com.example.cardview\_recyclerex;  
import android.content.Context;  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.ImageView;  
import android.widget.TextView;  
  
import androidx.annotation.NonNull;  
import androidx.recyclerview.widget.RecyclerView;  
  
import java.util.ArrayList;  
  
public class androidVersionAdapter extends RecyclerView.Adapter < androidVersionAdapter.Viewholder > {  
 *// array list to store all items* private ArrayList < androidVersion > androidList;  
 *// object of type ItemClicked to get our mainActivity using context passed in androidVersionAdapter* ItemClicked activity;  
 *//set an interface* public interface ItemClicked {  
 void onItemClicked(int index);  
 }  
 *//in this we will set our context i.e. mainActivity to activity object and arrayList* public androidVersionAdapter(Context context, ArrayList < androidVersion > List) {  
 androidList = List; *//arrayList* activity = (ItemClicked) context; *//mainActivity reference* }  
  
 public class Viewholder extends RecyclerView.ViewHolder {  
 ImageView ivicon; *//for imageView icon* TextView tvnam, tvversion; *//for textView name and version of android  
 //declate viewholder* public Viewholder(@NonNull View itemView) {  
 super(itemView);  
 tvnam = itemView.findViewById(R.id.*tvnam*); *//find and set android name TextView* tvversion = itemView.findViewById(R.id.*tvversion*); *//find and set android version textView* ivicon = itemView.findViewById(R.id.*ivicon*); *//find and set android icon ImageView* }  
 }  
 *//onCreateViewHolder method to return and set Viewholder* @NonNull  
 @Override  
 public androidVersionAdapter.Viewholder onCreateViewHolder(@NonNull ViewGroup parent, int viewType) {  
 View v = LayoutInflater.*from*(parent.getContext())  
 .inflate(R.layout.*list\_item*, parent, false);  
 return new Viewholder(v); *//return viewholder* }  
  
 *//onBindViewHolder method to bind different resourses with our holder* @Override  
 public void onBindViewHolder(@NonNull androidVersionAdapter.Viewholder holder, int position) {  
 holder.itemView.setTag(androidList.get(position)); *//get the position in the arrayList* holder.tvnam.setText(androidList.get(position)  
 .getName()); *//set text for name of android* holder.tvversion.setText(androidList.get(position)  
 .getVersion()); *//set text for version* if (androidList.get(position)  
 .getPrefer()  
 .equals("cupcake")) {  
 holder.ivicon.setImageResource(R.drawable.*ic\_launcher\_background*); *//get icon* } else {  
 holder.ivicon.setImageResource(R.drawable.*ic\_launcher\_foreground*); *//get icon* }  
 }  
 *//getItemCount method for returning the size of arrayList* @Override  
 public int getItemCount() {  
 return androidList.size();  
 }  
}**

**androidVersion.java**

**package com.example.cardview\_recyclerex;  
public class androidVersion {  
 String name;  
 String version;  
 String prefer;  
  
 public androidVersion(String name, String version, String prefer) {  
 this.name = name;  
 this.version = version;  
 this.prefer = prefer;  
 }  
 *// get name of android through this* public String getName() {  
 return name;  
 }  
 *// set name of android through this* public void setName(String name) {  
 this.name = name;  
 }  
 *// get version of android through this* public String getVersion() {  
 return version;  
 }  
 *// set version of android through this* public void setVersion(String version) {  
 this.version = version;  
 }  
 *// get prefer name of android through this* public String getPrefer() {  
 return prefer;  
 }  
 *// set prefer name of android through this* public void setPrefer(String prefer) {  
 this.prefer = prefer;  
 }  
}**

**Example3:**

**Dynamic Fragments –FragmentTransaction**

**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">  
  
 <FrameLayout  
 android:id="@+id/container\_a"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content" />  
  
 <FrameLayout  
 android:id="@+id/container\_b"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content" />  
  
</LinearLayout>**

**fragment1.xml**

***<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:background="@android:color/holo\_green\_light"  
 android:gravity="center\_horizontal"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <EditText  
 android:id="@+id/edit\_text"  
 android:hint="enter something "  
 android:textSize="25sp"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content" />  
  
 <Button  
 android:id="@+id/button\_ok"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Ok" />  
  
</LinearLayout>**

**fragment2.xml**

***<?*xml version="1.0" encoding="utf-8"*?>*<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:background="@android:color/holo\_blue\_light"  
 android:gravity="center\_horizontal"  
 android:orientation="vertical"  
 android:padding="16dp">  
  
 <EditText  
 android:id="@+id/edit\_text"  
 android:hint="enter something "  
 android:layout\_width="373dp"  
 android:layout\_height="100dp" />  
  
 <Button  
 android:id="@+id/button\_ok"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:text="Ok" />  
  
</LinearLayout>**

**Fragment1.java**

**package com.example.fragmentex2;  
import android.content.Context;  
import android.os.Bundle;  
*//import android.support.annotation.Nullable;  
//import android.support.v4.app.Fragment;*import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.Button;  
import android.widget.EditText;  
  
import androidx.annotation.Nullable;  
import androidx.fragment.app.Fragment;  
  
  
public class Fragment1 extends Fragment {  
 private Fragment1Listener listener;  
 private EditText editText;  
 private Button buttonOk;  
  
 public interface Fragment1Listener {  
 void onInputASent(CharSequence input);  
 }  
  
 @Nullable  
 @Override  
 public View onCreateView(LayoutInflater inflater, @Nullable ViewGroup container, @Nullable Bundle savedInstanceState) {  
 View v = inflater.inflate(R.layout.*fragment1*, container, false);  
  
 editText = v.findViewById(R.id.*edit\_text*);  
 buttonOk = v.findViewById(R.id.*button\_ok*);  
 buttonOk.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 CharSequence input = editText.getText();  
 listener.onInputASent(input);  
 }  
 });  
  
 return v;  
 }  
  
 public void updateEditText(CharSequence newText) {  
 editText.setText(newText);  
 }  
  
 @Override  
 public void onAttach(Context context) {  
 super.onAttach(context);  
 if (context instanceof Fragment1Listener) {  
 listener = (Fragment1Listener) context;  
 } else {  
 throw new RuntimeException(context.toString()  
 + " must implement Fragment1Listener");  
 }  
 }  
  
 @Override  
 public void onDetach() {  
 super.onDetach();  
 listener = null;  
 }  
}**

**Fragment2.java**

**package com.example.fragmentex2;  
  
import android.content.Context;  
import android.os.Bundle;  
  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.Button;  
import android.widget.EditText;  
  
import androidx.annotation.Nullable;  
import androidx.fragment.app.Fragment;  
  
  
public class Fragment2 extends Fragment {  
 private Fragment2Listener listener;  
 private EditText editText;  
 private Button buttonOk;  
  
 public interface Fragment2Listener {  
 void onInputBSent(CharSequence input);  
 }  
  
 @Nullable  
 @Override  
 public View onCreateView(LayoutInflater inflater, @Nullable ViewGroup container, @Nullable Bundle savedInstanceState) {  
 View v = inflater.inflate(R.layout.*fragment2*, container, false);  
  
 editText = v.findViewById(R.id.*edit\_text*);  
 buttonOk = v.findViewById(R.id.*button\_ok*);  
 buttonOk.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 CharSequence input = editText.getText();  
 listener.onInputBSent(input);  
 }  
 });  
  
 return v;  
 }  
  
 public void updateEditText(CharSequence newText) {  
 editText.setText(newText);  
 }  
  
 @Override  
 public void onAttach(Context context) {  
 super.onAttach(context);  
 if (context instanceof Fragment2Listener) {  
 listener = (Fragment2Listener) context;  
 } else {  
 throw new RuntimeException(context.toString()  
 + " must implement Fragment2Listener");  
 }  
 }  
  
 @Override  
 public void onDetach() {  
 super.onDetach();  
 listener = null;  
 }  
}**

**MainActivity.java**

**package com.example.fragmentex2;  
  
import android.os.Bundle;  
  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.fragment.app.FragmentManager;  
import androidx.fragment.app.FragmentTransaction;  
  
public class MainActivity extends AppCompatActivity implements Fragment1.Fragment1Listener, Fragment2.Fragment2Listener {  
 private Fragment1 fragmentA;  
 private Fragment2 fragmentB;  
  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
 fragmentA = new Fragment1();  
 fragmentB = new Fragment2();  
  
 getSupportFragmentManager().beginTransaction()  
 .replace(R.id.*container\_a*, fragmentA)  
 .replace(R.id.*container\_b*, fragmentB)  
 .commit();  
 }  
  
 @Override  
 public void onInputASent(CharSequence input) {  
 fragmentB.updateEditText(input);  
 }  
  
 @Override  
 public void onInputBSent(CharSequence input) {  
 fragmentA.updateEditText(input);  
 }  
}**