# **COS30017 – Software Development for Mobile Devices**

## **Formative Assignment 4**

### **Task 1**

Screenshot of application

A screenshot of a cell phone

Description automatically generatedA screen shot of a smart phone

Description automatically generated

Java Codes for MainActivity

package com.example.task1;  
  
import androidx.appcompat.app.AppCompatActivity;  
import androidx.fragment.app.FragmentManager;  
import androidx.recyclerview.widget.LinearLayoutManager;  
import androidx.recyclerview.widget.RecyclerView;  
import androidx.recyclerview.widget.StaggeredGridLayoutManager;  
import androidx.viewpager.widget.ViewPager;  
  
import android.net.Uri;  
import android.os.Bundle;  
import android.util.Log;  
import android.widget.LinearLayout;  
  
import java.io.BufferedReader;  
import java.io.IOException;  
import java.io.InputStream;  
import java.io.InputStreamReader;  
import java.io.Reader;  
import java.io.UnsupportedEncodingException;  
import java.nio.Buffer;  
import java.util.ArrayList;  
import java.util.Scanner;  
  
public class MainActivity extends AppCompatActivity implements FragmentOne.OnFragmentInteractionListener,FragmentTwo.OnFragmentInteractionListener,FragmentThree.OnFragmentInteractionListener{  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
  
  
 ViewPager viewPager = findViewById(R.id.*viewPager*);  
 ViewPagerAdapter viewPagerAdapter = new ViewPagerAdapter  
 (this,getSupportFragmentManager());  
 viewPager.setAdapter(viewPagerAdapter);  
  
 }  
  
  
 @Override  
 public void onFragmentInteraction(String fragment) {  
  
 }  
}

Java Codes for Link class

package com.example.task1;  
  
import android.content.Context;  
import android.view.View;  
  
import java.io.InputStream;  
import java.net.URL;  
import java.util.ArrayList;  
import java.util.Scanner;  
  
public class Link {  
 private String category;  
 private String title;  
 private String photo;  
 private String URL;  
  
 public Link(String category, String title, String photo, String URL) {  
 this.category = category;  
 this.title = title;  
 this.photo = photo;  
 this.URL = URL;  
 }  
  
 public String getCategory() {  
 return category;  
 }  
  
 public void setCategory(String category) {  
 this.category = category;  
 }  
  
 public String getURL() {  
 return URL;  
 }  
  
 public void setURL(String URL) {  
 this.URL = URL;  
 }  
  
  
 public String getTitle() {  
 return title;  
 }  
  
 public void setTitle(String title) {  
 this.title = title;  
 }  
  
 public String getImageName() {  
 return photo;  
 }  
  
 public void setImageName(String imageName) {  
 this.photo = imageName;  
 }  
  
 public static ArrayList<Link> createLinkList(View view){  
 ArrayList<Link> links = new ArrayList<>();  
 ArrayList<String> title = new ArrayList<>();  
 ArrayList<String> photo = new ArrayList<>();  
 ArrayList<String> URL = new ArrayList<>();  
 ArrayList<String> category = new ArrayList<>();  
  
 InputStream input = view.getResources().openRawResource(R.raw.*news\_items*);  
 Scanner scanner = new Scanner(input);  
 while(scanner.hasNext()){  
 String line = scanner.nextLine();  
  
 String[] pieces = line.split(":",2);  
  
 switch(pieces[0]){  
 case "title":  
 title.add(pieces[1]);  
 break;  
 case "photo":  
 String[] temp = pieces[1].split("\\.");  
 photo.add(temp[0]);  
 break;  
 case "website":  
 URL.add(pieces[1]);  
 break;  
 case "category":  
 category.add(pieces[1]);  
 break;  
 }  
 }  
 //by right the size is 9,since they are 9 items.  
 for(int i=0;i<title.size();i++){  
 links.add(new Link(category.get(i),title.get(i),photo.get(i),URL.get(i)));  
 }  
  
 return links;  
 }  
}

Java Codes for RecyclerViewAdapter

package com.example.task1;  
  
import android.app.Activity;  
import android.content.Context;  
import android.net.Uri;  
import android.util.Log;  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.ImageView;  
import android.widget.TextView;  
import android.widget.Toast;  
  
import androidx.annotation.NonNull;  
import androidx.fragment.app.FragmentActivity;  
import androidx.recyclerview.widget.RecyclerView;  
  
import java.util.ArrayList;  
  
public class RecyclerViewAdapter extends RecyclerView.Adapter<RecyclerViewAdapter.ViewHolder>{  
 private ArrayList<Link> links;  
 private Context context;  
  
 public RecyclerViewAdapter(Context context, ArrayList<Link> links) {  
 this.context=context;  
 this.links = links;  
 }  
  
 @NonNull  
 @Override  
 public ViewHolder onCreateViewHolder(@NonNull ViewGroup parent, int viewType) {  
 View view = LayoutInflater.*from*(parent.getContext()).inflate(R.layout.*recycler\_layout*,  
 parent,false);  
 return new ViewHolder(view);  
 }  
  
 @Override  
 public void onBindViewHolder(@NonNull ViewHolder holder, int position) {  
 Link link=links.get(position);  
 int resID = holder.image.getResources().getIdentifier(link.getImageName(),  
 "drawable",holder.image.getContext().getPackageName());  
 holder.image.setImageResource(resID);  
 holder.title.setText(link.getTitle());  
  
 }  
  
 @Override  
 public int getItemCount() {  
 return links.size();  
 }  
  
 public class ViewHolder extends RecyclerView.ViewHolder implements View.OnClickListener{  
 public ImageView image;  
 public TextView title;  
 public ViewHolder(@NonNull View itemView) {  
 super(itemView);  
 image=itemView.findViewById(R.id.*image*);  
 title=itemView.findViewById(R.id.*title*);  
 itemView.setOnClickListener(this);  
 }  
  
 @Override  
 public void onClick(View v) {  
 int pos= getAdapterPosition(); //should pass the URL into webview in fragment three  
 if(links.get(pos).getCategory().equals("cybersecurity")){  
 FragmentThree fragmentThree = new FragmentThree(links.get(pos).getURL());  
 ((FragmentActivity)context).getSupportFragmentManager()  
 .beginTransaction()  
 .replace(R.id.*fragment\_one*,fragmentThree)  
 .addToBackStack(null)  
 .commit();  
 }else{  
 FragmentThree fragmentThree = new FragmentThree(links.get(pos).getURL());  
 ((FragmentActivity)context).getSupportFragmentManager()  
 .beginTransaction()  
 .replace(R.id.*fragment\_two*,fragmentThree)  
 .addToBackStack(null)  
 .commit();  
 }  
  
 }  
 }  
}

Java Codes for FragmentOne

package com.example.task1;  
  
import android.content.Context;  
import android.net.Uri;  
import android.os.Bundle;  
  
import androidx.fragment.app.Fragment;  
import androidx.recyclerview.widget.RecyclerView;  
import androidx.recyclerview.widget.StaggeredGridLayoutManager;  
  
import android.util.Log;  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.LinearLayout;  
import android.widget.Toast;  
  
import java.util.ArrayList;  
  
  
public class FragmentOne extends Fragment{  
  
 private ArrayList<Link> linkArrayList;  
 private RecyclerView recyclerView;  
 private RecyclerViewAdapter recyclerViewAdapter;  
 private Context context;  
 private OnFragmentInteractionListener mListener;  
  
 public FragmentOne(Context context) {  
 // Required empty public constructor  
 this.context=context;  
 }  
  
  
 @Override  
 public View onCreateView(LayoutInflater inflater, ViewGroup container,  
 Bundle savedInstanceState) {  
 // Inflate the layout for this fragment  
 View view = inflater.inflate(R.layout.*fragment\_one*, container, false);  
 initMain(view);  
 return view;  
 }  
  
 private void initMain(View view) {  
 initRecycler(view);  
 }  
  
 private void initRecycler(View view) {  
 linkArrayList=Link.*createLinkList*(view);  
 ArrayList<Link> cyber = new ArrayList<>();  
 for(int i=0;i<linkArrayList.size();i++){  
 if(linkArrayList.get(i).getCategory().contains("cybersecurity")){  
 cyber.add(linkArrayList.get(i));  
 }  
 }  
 recyclerView = view.findViewById(R.id.*recyclerview*);  
 StaggeredGridLayoutManager staggeredGridLayoutManager = new StaggeredGridLayoutManager(2, LinearLayout.*VERTICAL*);  
 recyclerView.setLayoutManager(staggeredGridLayoutManager);  
 recyclerViewAdapter = new RecyclerViewAdapter(context,cyber);  
 recyclerView.setAdapter(recyclerViewAdapter);  
  
 }  
  
 // *TODO: Rename method, update argument and hook method into UI event* public void onButtonPressed(String fragment) {  
 if (mListener != null) {  
 mListener.onFragmentInteraction(fragment);  
 }  
 }  
  
 @Override  
 public void onAttach(Context context) {  
 super.onAttach(context);  
 if (context instanceof OnFragmentInteractionListener) {  
 mListener = (OnFragmentInteractionListener) context;  
 } else {  
 throw new RuntimeException(context.toString()  
 + " must implement OnFragmentInteractionListener");  
 }  
 }  
  
 @Override  
 public void onDetach() {  
 super.onDetach();  
 mListener = null;  
 }  
  
 public interface OnFragmentInteractionListener {  
 // *TODO: Update argument type and name* void onFragmentInteraction(String fragment);  
 }  
}

Java Codes for FragmentTwo

package com.example.task1;  
  
import android.content.Context;  
import android.net.Uri;  
import android.os.Bundle;  
  
import androidx.fragment.app.Fragment;  
import androidx.recyclerview.widget.RecyclerView;  
import androidx.recyclerview.widget.StaggeredGridLayoutManager;  
  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.AdapterView;  
import android.widget.LinearLayout;  
  
import java.util.ArrayList;  
  
  
public class FragmentTwo extends Fragment {  
  
 private ArrayList<Link> linkArrayList;  
 private RecyclerView recyclerView;  
 private RecyclerViewAdapter recyclerViewAdapter;  
 private Context context;  
 private OnFragmentInteractionListener mListener;  
  
 public FragmentTwo(Context context) {  
 // Required empty public constructor  
 this.context=context;  
 }  
  
  
  
  
 @Override  
 public View onCreateView(LayoutInflater inflater, ViewGroup container,  
 Bundle savedInstanceState) {  
 // Inflate the layout for this fragment  
 View view = inflater.inflate(R.layout.*fragment\_two*, container, false);  
 initMain(view);  
 return view;  
 }  
  
 private void initMain(View view) {  
 initRecycler(view);  
 }  
  
 private void initRecycler(View view) {  
 linkArrayList=Link.*createLinkList*(view);  
 ArrayList<Link> ai = new ArrayList<>();  
 for(int i=0;i<linkArrayList.size();i++){  
 if(linkArrayList.get(i).getCategory().contains("AI")){  
 ai.add(linkArrayList.get(i));  
 }  
 }  
 recyclerView = view.findViewById(R.id.*recyclerview2*);  
 StaggeredGridLayoutManager staggeredGridLayoutManager = new StaggeredGridLayoutManager(2, LinearLayout.*VERTICAL*);  
 recyclerView.setLayoutManager(staggeredGridLayoutManager);  
 recyclerViewAdapter = new RecyclerViewAdapter(context,ai);  
 recyclerView.setAdapter(recyclerViewAdapter);  
 }  
  
 // *TODO: Rename method, update argument and hook method into UI event* public void onButtonPressed(String fragment) {  
 if (mListener != null) {  
 mListener.onFragmentInteraction(fragment);  
 }  
 }  
  
 @Override  
 public void onAttach(Context context) {  
 super.onAttach(context);  
 if (context instanceof OnFragmentInteractionListener) {  
 mListener = (OnFragmentInteractionListener) context;  
 } else {  
 throw new RuntimeException(context.toString()  
 + " must implement OnFragmentInteractionListener");  
 }  
 }  
  
 @Override  
 public void onDetach() {  
 super.onDetach();  
 mListener = null;  
 }  
  
 public interface OnFragmentInteractionListener {  
 // *TODO: Update argument type and name* void onFragmentInteraction(String fragment);  
 }  
}

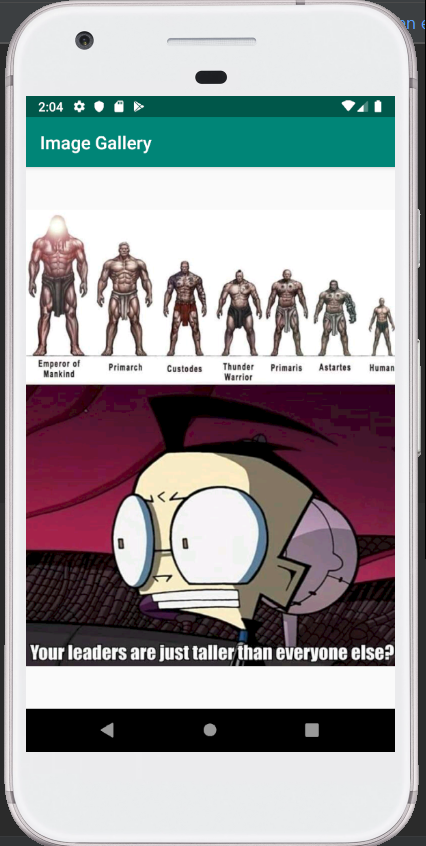
Java Codes for FragmentThree

package com.example.task1;  
  
import android.content.Context;  
import android.graphics.Bitmap;  
import android.net.Uri;  
import android.os.Bundle;  
  
import androidx.fragment.app.Fragment;  
  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.webkit.WebChromeClient;  
import android.webkit.WebView;  
import android.webkit.WebViewClient;  
import android.widget.ProgressBar;  
  
  
public class FragmentThree extends Fragment {  
 private WebView webView;  
 private String URL;  
 private ProgressBar progressBar;  
  
 private OnFragmentInteractionListener mListener;  
  
 public FragmentThree(String url) {  
 // Required empty public constructor  
 this.URL = url;  
 }  
  
  
 @Override  
 public View onCreateView(LayoutInflater inflater, ViewGroup container,  
 Bundle savedInstanceState) {  
 // Inflate the layout for this fragment  
 View view = inflater.inflate(R.layout.*fragment\_three*, container, false);  
 initMain(view);  
 return view;  
 }  
  
 private void initMain(View view) {  
 webView = view.findViewById(R.id.*webview*);  
 progressBar = view.findViewById(R.id.*progressbar*);  
  
 webView.loadUrl(URL);  
 webView.setWebViewClient(new WebViewClient(){  
 @Override  
 public void onPageStarted(WebView view, String url, Bitmap favicon) {  
 super.onPageStarted(view, url, favicon);  
 view.setVisibility(View.*VISIBLE*);  
 }  
  
 @Override  
 public void onPageFinished(WebView view, String url) {  
 super.onPageFinished(view, url);  
  
 progressBar.setVisibility(View.*GONE*);  
 view.setVisibility(View.*VISIBLE*);  
 }  
 });  
  
  
 }  
  
 // *TODO: Rename method, update argument and hook method into UI event* public void onButtonPressed(String fragment) {  
 if (mListener != null) {  
 mListener.onFragmentInteraction(fragment);  
 }  
 }  
  
 @Override  
 public void onAttach(Context context) {  
 super.onAttach(context);  
 if (context instanceof OnFragmentInteractionListener) {  
 mListener = (OnFragmentInteractionListener) context;  
 } else {  
 throw new RuntimeException(context.toString()  
 + " must implement OnFragmentInteractionListener");  
 }  
 }  
  
 @Override  
 public void onDetach() {  
 super.onDetach();  
 mListener = null;  
 }  
  
 public interface OnFragmentInteractionListener {  
 // *TODO: Update argument type and name* void onFragmentInteraction(String fragment);  
 }  
}

### **Task 2**

Screenshots

A picture containing photo

Description automatically generated

Java Codes for MainActivity

package com.example.task2;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.os.Bundle;  
import android.util.Log;  
import android.widget.GridView;  
  
public class MainActivity extends AppCompatActivity {  
 GridView gridView;  
 public static String *KEY*="IMAGE";  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_main*);  
 String[] links = getResources().getStringArray(R.array.*links*);  
 gridView=findViewById(R.id.*gridView*);  
 GridAdapter gridAdapter = new GridAdapter(this,links); //replace imgID with URLs  
 gridView.setAdapter(gridAdapter);  
 }  
}

Java Codes for GridAdapter

package com.example.task2;  
  
import android.content.Context;  
import android.content.Intent;  
import android.graphics.Bitmap;  
import android.media.Image;  
import android.media.ThumbnailUtils;  
import android.text.Layout;  
import android.util.Log;  
import android.view.LayoutInflater;  
import android.view.View;  
import android.view.ViewGroup;  
import android.widget.BaseAdapter;  
import android.widget.ImageView;  
import android.widget.Toast;  
  
import com.android.volley.VolleyError;  
import com.android.volley.toolbox.ImageLoader;  
  
public class GridAdapter extends BaseAdapter {  
 Context context;  
 private String links[];  
 LayoutInflater layoutInflater;  
 private final int THUMBNAIL\_SIZE=250;  
 View view;  
  
 public GridAdapter(Context context,String[] links) {  
 this.context = context;  
 this.links=links;  
 }  
  
 @Override  
 public int getCount() {  
 return links.length;  
 }  
  
 @Override  
 public Object getItem(int position) {  
 return null;  
 }  
  
 @Override  
 public long getItemId(int position) {  
 return 0;  
 }  
  
 @Override  
 public View getView(final int position, View convertView, ViewGroup parent) {  
 layoutInflater = (LayoutInflater) context.getSystemService(Context.*LAYOUT\_INFLATER\_SERVICE*);  
 if(convertView==null){  
 view = new View(context);  
 view = layoutInflater.inflate(R.layout.*img\_layout*,null);  
 final ImageView imageView = view.findViewById(R.id.*imageView*);  
 ImageLoader imageLoader = MySingleton.*getInstance*(context.getApplicationContext()).getImageLoader();  
 imageLoader.get(links[position], new ImageLoader.ImageListener() {  
 @Override  
 public void onResponse(ImageLoader.ImageContainer response, boolean isImmediate) {  
 Bitmap image = response.getBitmap();  
 Bitmap thumbnail = ThumbnailUtils.*extractThumbnail*(image,THUMBNAIL\_SIZE,THUMBNAIL\_SIZE);  
 imageView.setImageBitmap(thumbnail);  
 }  
  
 @Override  
 public void onErrorResponse(VolleyError error) {  
 System.*out*.println(error.getMessage());  
 }  
 });  
 imageView.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 Intent intent = new Intent(context.getApplicationContext(),SecondActivity.class);  
 intent.putExtra(MainActivity.*KEY*,links[position]);  
 context.startActivity(intent);  
 }  
 });  
 }  
 return view;  
 }  
  
}

Java Codes for MySingleton

package com.example.task2;  
  
import android.content.Context;  
import android.graphics.Bitmap;  
import android.util.LruCache;  
  
import com.android.volley.RequestQueue;  
import com.android.volley.toolbox.ImageLoader;  
import com.android.volley.toolbox.Volley;  
  
public class MySingleton {  
 private static MySingleton *mySingleton*;  
 private static Context *context*;  
 private RequestQueue requestQueue;  
 private ImageLoader imageLoader;  
  
 public MySingleton(Context context) {  
 this.*context* = context;  
 requestQueue = Volley.*newRequestQueue*(context);  
 imageLoader = new ImageLoader(requestQueue, new ImageLoader.ImageCache() {  
 private final LruCache<String,Bitmap> cache = new LruCache<>(3);  
  
 @Override  
 public Bitmap getBitmap(String url) {  
 Bitmap bmp = cache.get(url);  
 if(bmp==null){  
 System.*out*.println("Image not in cache");  
 }else{  
 System.*out*.println("Image is in cache");  
 }  
 return bmp;  
 }  
  
 @Override  
 public void putBitmap(String url, Bitmap bitmap) {  
 System.*out*.println("Put image in cache");  
 cache.put(url,bitmap);  
 }  
 });  
 }  
 public static synchronized MySingleton getInstance(Context context){  
 if(*mySingleton*==null){  
 *mySingleton* = new MySingleton(context);  
 }  
 return *mySingleton*;  
 }  
  
 public ImageLoader getImageLoader(){  
 return imageLoader;  
 }  
}

Java Codes for SecondActivity

package com.example.task2;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import android.graphics.Bitmap;  
import android.os.Bundle;  
import android.widget.ImageView;  
  
import com.android.volley.VolleyError;  
import com.android.volley.toolbox.ImageLoader;  
  
public class SecondActivity extends AppCompatActivity {  
 ImageView imageView;  
 @Override  
 protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.*activity\_second*);  
  
 imageView=findViewById(R.id.*imageView2*);  
 Bundle bundle = getIntent().getExtras();  
 String link = bundle.getString(MainActivity.*KEY*);  
 ImageLoader imageLoader = MySingleton.*getInstance*(getApplicationContext()).getImageLoader();  
 imageLoader.get(link, new ImageLoader.ImageListener() {  
 @Override  
 public void onResponse(ImageLoader.ImageContainer response, boolean isImmediate) {  
 Bitmap bitmap = response.getBitmap();  
 imageView.setImageBitmap(bitmap);  
 }  
  
 @Override  
 public void onErrorResponse(VolleyError error) {  
  
 }  
 });  
 }  
}