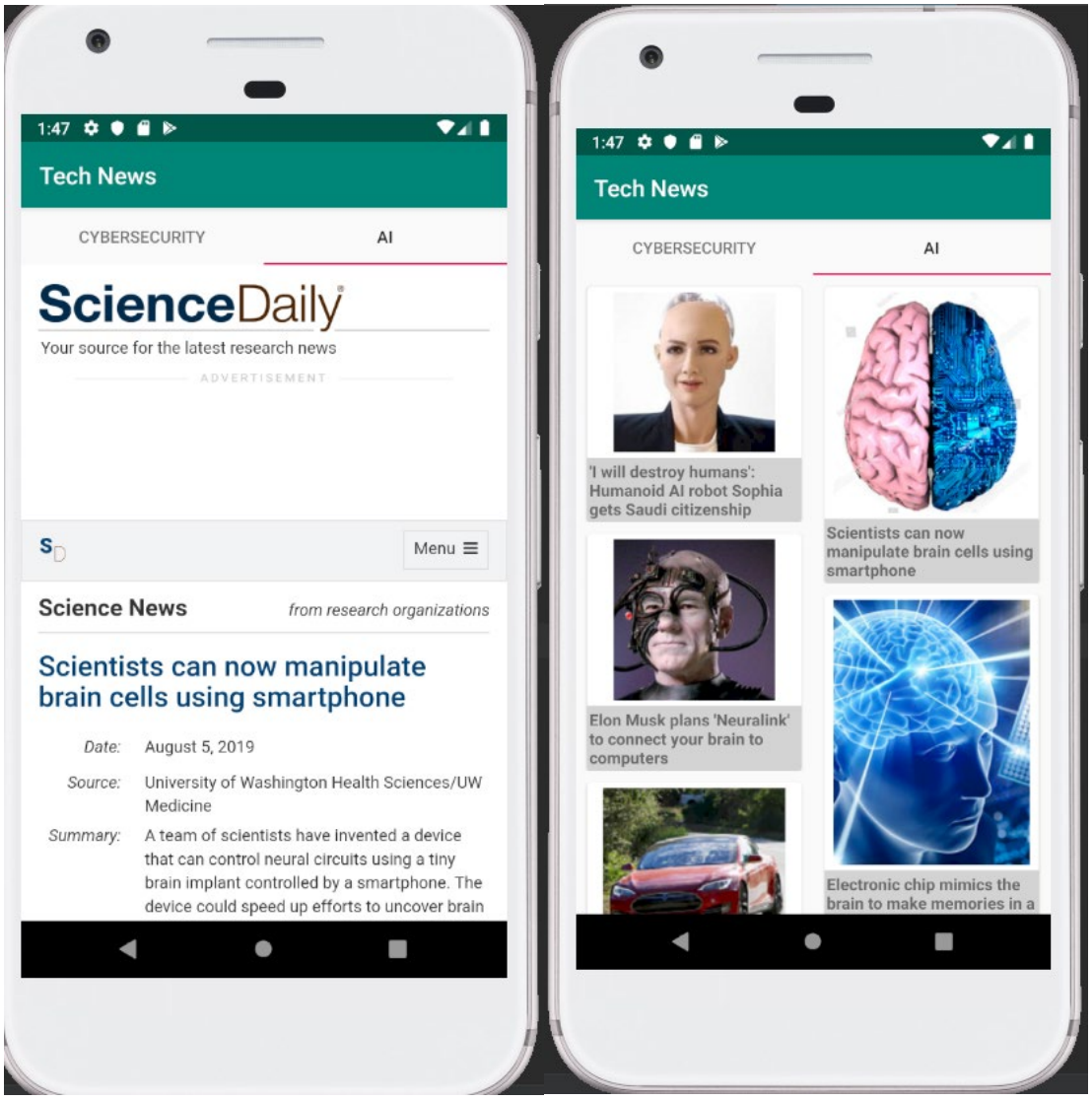
COS30017 – Software Development for Mobile Devices

Formative Assignment 4

Task 1

Screenshot of application



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);
   }
}
```

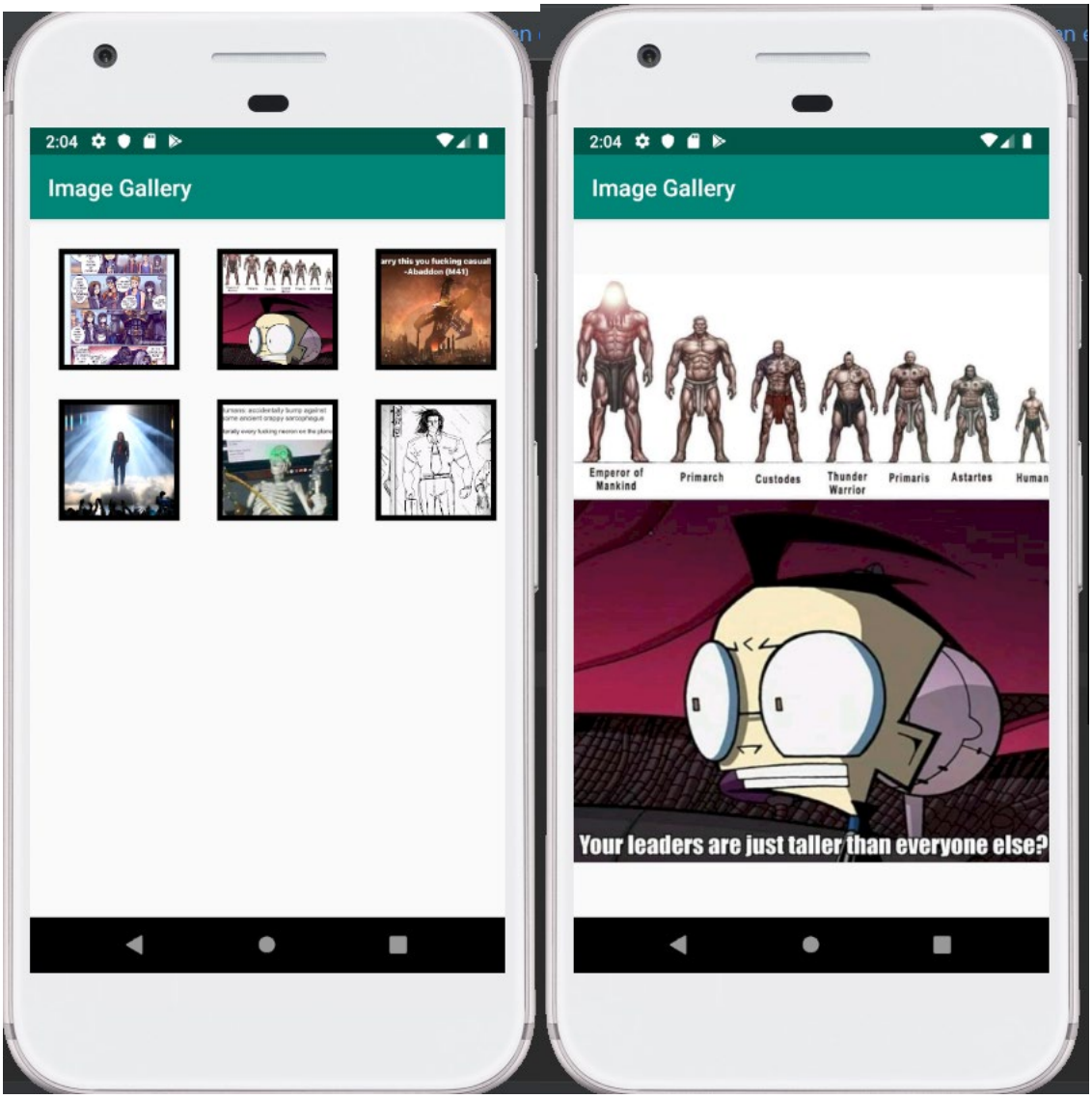
Java Codes for FragmentThree

```
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



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) {

            }
        });
    }
}
```