**Midterm for CS 374 / 639 - Android**

**Spring 2021**

**Versions 1, 2 and 3**

**Dr. Scharff**

* **Read the complete document.**
* **Complete this document. Rename it as *MidtermLastNameFirstnam2020-vX.docx. X depends on the version of the test that you must do.***
* **Do not change the order of the questions.**
* **Do not remove anything in the document.**
* **Put your code and apk file in GitHub (apk at the root).**
* **You should do the written part before the practical part. Submit the written part in classes.**
* **You will work alone. You will not copy answers from the web.**
* **You have 2 HOURS.**

**Your name:**

**Pledge:**

1. **Practical part (100 points)**

**Version 1:** Develop an app that converts miles into kilometers. The app will take miles as inputs and return kms as outputs. Note: 1 miles = 1.609 km.

**Version 2:** Develop an app that converts dollars into euros. The app will take dollars as inputs and return euros as outputs. Note: 1 dollar = 0.88 euro.

**Version 3:** Develop an app that converts euros into dollars. The app will take euros as inputs and return dollars as outputs. Note: 1 euro = 1,13 dollar.

Begin with the design on paper, then a basic design in XML, the logic and finish with making your app beautiful!

Fragments are optional.

Push your code to github with the name MidtermFristNameLastNameVXXX where XXX is 1, 2 or 3 (version).

**Grading criteria:**

* Names of files should be respected (-10 if not correct)
* Code is in GitHub (-10 if not correct)
* Apk is easily accessible (-10 if not correct)
* Code is formatted to be readable (-10 if not correct)
* Code uses variables with well-chosen names (in Java and XML) (-10 if not correct)
* The app does what it is supposed to do
* There is no crash (Be sure that the app does not crash if the field is empty -10 if not correct)
* Look-and-feel (UI) is modern and appealing
* The user experience (UX) to do the computation is seamless and the generated message do generate confusion (IMPORTANT)
* Code that is in GitHub should be runnable. You need to submit a version that works in GitHub, even if it is not complete (-60 if not correct)

1. **Written part (100 points)**

**Each question counts as 7 points – except question 9 that counts for 9 points.**

**Do not copy from the web. Use your own words.**

**Just answer your question. No narrative necessary.**

1. **Version 1:** What is the permission that permits to send an SMS? Provide the XML code that will be present in AndroidManifest.xml.

**Version 2:** What is the permission that permits to use the Internet? Provide the XML code that will be present in AndroidManifest.xml.

**Version 3:** What is the permission that permits to make a call? Provide the XML code that will be present in AndroidManifest.xml.

<uses-permission android:name=”android.permission.CALL\_PHONE” />

1. **Version 1:** What is the directory where image files are located?

**Version 2:** What is the directory where layout files are located?

**Version 3:** What is the directory where string files are located?

Res 🡪 values

Values directory

1. During an Activity lifetime, what is the first callback method of the *Activity* class invoked by the system?

onCreate()

1. In order to display a Ul defined in the XML layout file *main.xml*, what *Activity* method should be called?

setContentView(R.layout.main);

1. What *Activity* method should be called to retrieve a reference to an Android view by using the *id* attribute of an XML resource?

(Please note, Id of the referenced view = ref\_id)

findViewById(R.id.ref\_id);

1. What does the following code achieve? What activity is launched?

Intent intent = new Intent(FirstActivity.this, SecondActivity.class);

startActivityForResult(intent);

Launches SecondActivity and expects a result from SecondActivity by the FirstActivity

1. Version 1: Write the code to log *information* about the value of variable *x.*

Version 2: Write the code to log an *error* about the value of variable *x.*

Version 3: Write the code to log a *warning* about the value of variable *x.*

Log.w(“MainActivity”, x);

1. Write the code to create a Toast that displays “*This is not a bug, but a feature!*”. The duration of the Toast is *Toast.LENGTH\_SHORT*. *Do not forget to make the Toast visible!*

Complete the code below:

Context context = getApplicationContext();

Toast toast = Toast.makeText(context, ”This is not a bug, but a feature, Toast.LENGTH\_SHORT);

Toast.show();

1. Complete the code of the following AsyncTask class. What you have to complete is introduced by \_\_\_\_. There are 5 blank spaces.

**Write your answers DIRECTLY in the code. If you use 1. 2. 3. Etc at the end you will get 0 for the question.**

public class DownloadFilesTask extends AsyncTask<URL, Integer, Long> {

protected Long doInBackground(URL... urls) {  
         int count = urls.length;  
         long totalSize = 0;  
         for (int i = 0; i < count; i++) {  
             totalSize += Downloader.downloadFile(urls[i]);  
             publishProgress((int) ((i / (float) count) \* 100));  
             // Escape early if cancel() is called  
             if (isCancelled()) break;  
         }  
         return totalSize;  
     }  
  
     protected void onProgressUpdate(Integer... progress) {  
         setProgressPercent(progress[0]);  
     }  
  
     protected void onPostExecute(Long result) {  
         showDialog("Downloaded " + result + " bytes");  
     }  
 }

How do you execute a DownloadFilesTask t?

DownloadFilesTask t = new DownloadFilesTask();

t.execute();

1. What is the name of the build system that is used in Android Studio?

Gradle

1. Define what a Fragment is. Provide an example of a situation where you would use a fragment. [Your own example, not from the web! Use your own words.]

It is a part that we can reuse in our UI. It has it’s own layout which it manages by it self.

Fragments have a lifecycle of their own

Can handle inputs

To display an image (Asynchronously) on the UI (Fragment part) when clicked on a button.

1. Explain what is/are the difference/s between *ConstraintLayout and RelativeLayout*? [No answer from the web, use your own words.]

Constraint layout :–

Better performance since this has a flat view hierarchy

Can be dragged and dropped conveniently

Relative layout :–

Requires multiple nested layouts to display content. Therefore less performance.

Drag-drop is not so convenient.

1. What is the method of *ValueEventListener* to retrieve a value in a Firebase database?

.getValue()

1. Write a JSON *array* of students where each student is defined by a name and a major. Use the correct syntax.

{“students”:

[

{

“name”: “Athauda”

“major”: “CS”

},

{

“name”: “Adam”

“major”: “IS”

},

{

“name”: “Rodrigo”

“major”: “CS”

},

]

}