National University of Computer and Emerging Sciences, Lahore Campus

Course Name:	**Software for Mobile Devices**	**Course Code:**	**CS-4039**
Degree Program:	**BS(CS)**	**Semester:**	**Fall 2022**
Exam Duration:	**180 Minutes**	**Total Marks:**	**60**
Paper Date:	**20 – DEC- 2022**	**Weight:**	**40**
Section:	**ALL**	**Page(s):**	**9**
Exam Type:	**Final**		

Student Name:_____ **Roll No.**_____ **Section:**_____

Instruction/Notes: This exam is open book and open notes. While writing code, make best effort to write correct and relevant code only. Minor syntactic errors are acceptable and will be ignored during marking but overall concept and approach must be correct.

Question 1 **30 points**

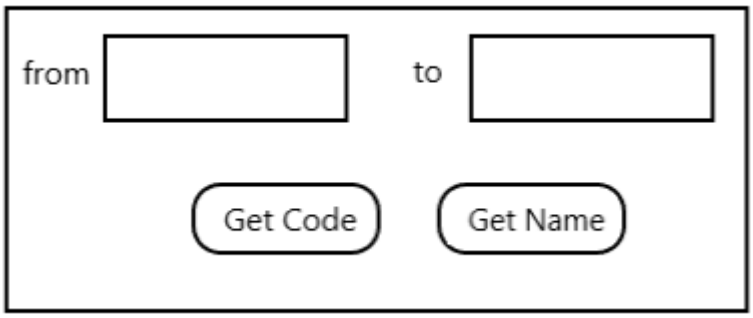
Develop a simple Activity to display and manage a Stop Watch using two Fragments. The display is in **Display Fragment** while the control buttons in **Control Fragment**. Pressing the start button shall start the timer (updating display fragment every msec), stop button shall halt it temporarily and reset shall revert to initial (00:00:00.0) state. You may assume that layouts for each fragment as well as activity are already defined. Write Java / Kotlin code for behavioral aspects.

Question 2 **20 points**

There is often a requirement to convert country dial codes; for instance, 92 is dial code for Pakistan, 44 for United Kingdom, etc.

(a) Develop a simple **remote bound service** that can convert the code to country, and also vice-versa i.e. country to code. Keep two hash-tables: one for mapping the country names to dial codes and the other for dial code to country name. Correspondingly implement two functions: getCountryName and getCountryCode, where the former takes code as input and return the name, while the later takes name as input and return the code. Provide all the necessary code for implementing and calling this as a **remote bound service**.

(b) Write code for an Activity that calls the **remote bound service** developed in part-a to do the conversion. A mockup for the activity is shown below:



from and **to** are two **EditText**s while **Get Code** and **Get Name** are two buttons that should invoke the service, send the from value as input and show the result in the to field. You may assume that layout is already implemented.

Question 3 **10 points**

Answer the following questions, in the space provided:

1. Suppose you have a service running in the background that is draining the battery. You intend to stop the service when the battery gets low and restart when your device is connected to charging. What strategy will you use for this purpose? Briefly explain its working.

2. Suppose a recent application that you are working has a requirement to capture and return a profile photo of the user. What strategy will you use to implement this functionality? Briefly explain its working.