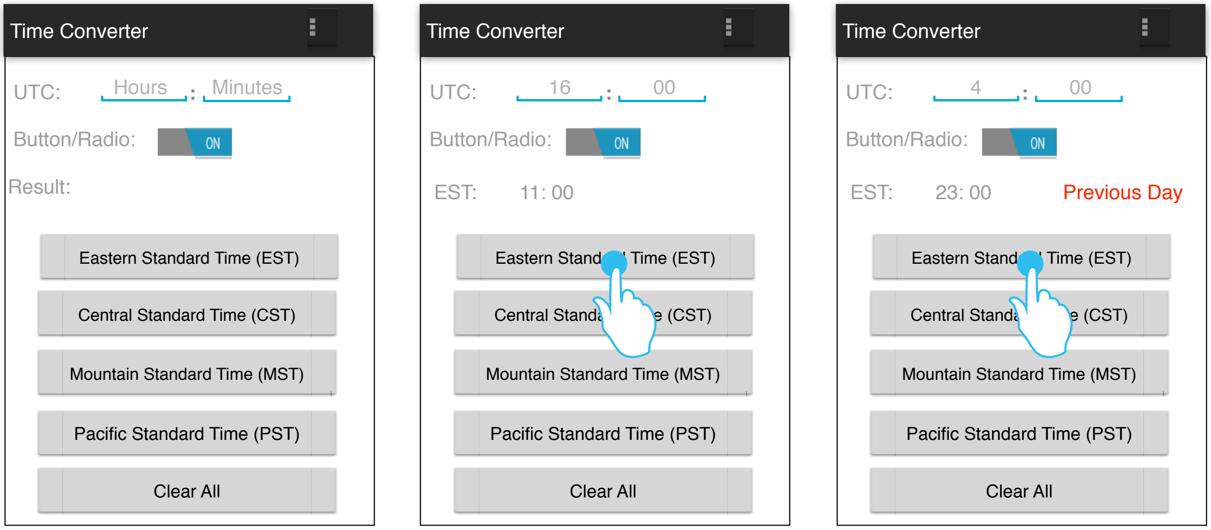
ITIS/ITCS 4180/5180 Mobile Application Development
Homework 01

Basic Instructions:

1. In every file submitted you MUST place the following comments:
   a. Assignment #.
   b. File Name.
   c. Full name of all students in your group.
2. Each student in the group is required to submit the assignment on canvas.
3. Please download the support files provided with this assignment and use them when implementing your project.
4. Export your Android project and create a zip file which includes all the project folder and any required libraries.
5. Submission details:
   a. All the group members should submit the same zip file.
   b. The file name is very important and should follow the following format: **Group#_HW01.zip**
   c. You should submit the assignment through Moodle: Submit the zip file.
6. **Failure to follow the above instructions will result in point deductions.**

Homework 01 (100 Points)

In this assignment, you will build your first Android application. You will get familiar with some common Android components and how to interact with them. You will build a time difference calculator application comprising of a single activity.


Time Converter
Eastern Standard Time (EST)
Central Standard Time (CST)
Mountain Standard Time (MST)
Pacific Standard Time (PST)
Clear All
ON

UTC: Hours : Minutes
Button/Radio: ON
Result:

UTC: 16 : 00
Button/Radio: ON
EST: 11: 00

UTC: 4 : 00
Button/Radio: ON
EST: 23: 00 Previous Day

(a) Initial Screen **(b) Conversion UTC to EST** **(c) Previous Day Case**

Figure 1 Application User Interface (Part 1)

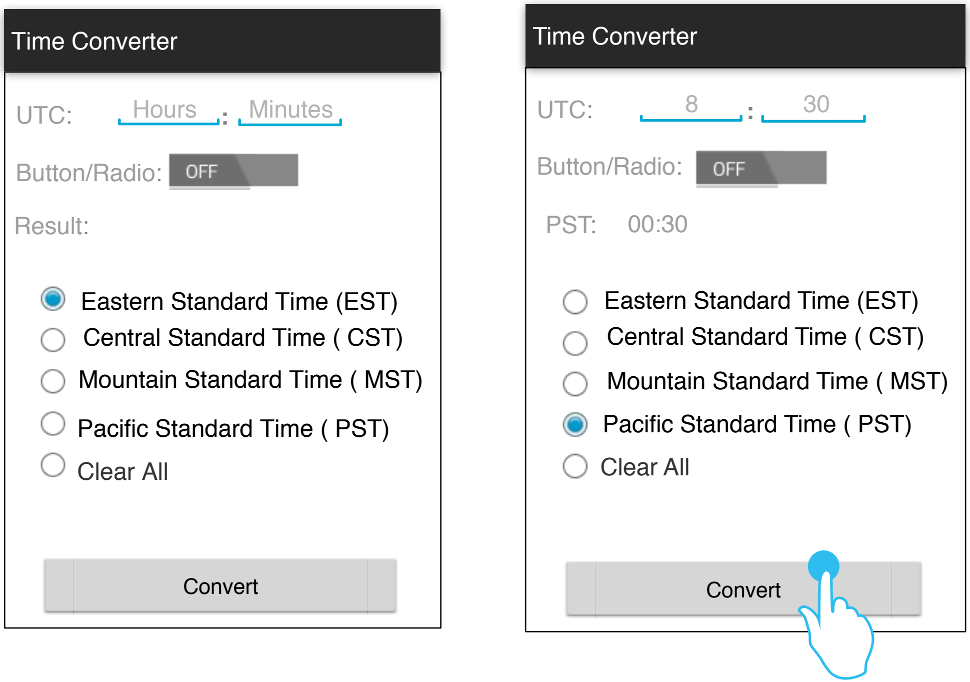
Part 1 (50 Points): Using Buttons

The interface should be created to match the user interface presented in Figure 1(a). You will be using layout files, and strings.xml to create the user interface. The layout XML file can be modified through the raw xml, or through the GUI tools provided within Android Studio. To build the UI, please follow the following tasks:

1. Create a new android project called “HW1”.
2. The string values used for the button labels should be read from the strings.xml file and should not be hardwired in the layout file.
3. This is a simple time calculator that performs time zone conversion from Universal Time Coordinated (UTC) to four other time zones (EST,CST,MST,PST). Each button will perform the logic of the corresponding conversion and display the converted time in the Result TextView in the format shown in Figure 1(b). The conversion formula from (UTC) to the above four time zones are as follows:
   a. EST = UTC - 5:00
   b. CST = UTC - 6:00
   c. MST = UTC - 7:00
   d. PST = UTC - 8:00

4. Use the “hint” attribute to set the “Hours”, “Minutes” grayed out hint in the EditViews of the input fields for Hours and Minutes.
5. Use 24 hour format. The time conversion should be recomputed to reflect the change and conversion should be presented accordingly.

6. The length of input entry of hours and minutes should be restricted to 2 digits. Values in hours field should range from 0 - 24; while minutes values should range from 0-60 in the minutes field. If the user attempts to enter a number outside these ranges you should print a Toast message and clear the entered content.
7. The Result should be displayed in the format: XXX : HH:MM. Where XXX is the time zone clicked.
8. There are cases where time will convert to a specific time in previous day. See Figure 1(c). In that case, a red text of Previous Day should be displayed beside the result time.
9. Your code should check for special cases such as when no amount is entered, invalid number and special characters. In such cases, display a Toast message indicating the error.
10. ClearAll: should clear the entered amount and the result, and set them to their default grayed out hints “Hours”,”Minutes” and “Result:” respectively (See Figure 1(a)).
11. Use Switch Button to specify the UI elements to be used. By default the switch button will be ON which means using Buttons. Toggling the switch should update the UI to use Radio Buttons. This action should dynamically change the Activity UI to be as indicated Part2.



Time Converter

UTC: Hours : Minutes

Button/Radio: OFF

Result:

● Eastern Standard Time (EST)
○ Central Standard Time (CST)
○ Mountain Standard Time (MST)
○ Pacific Standard Time (PST)
○ Clear All

Convert

(a) Initial Screen

Time Converter

UTC: 8 : 30

Button/Radio: OFF

PST: 00:30

○ Eastern Standard Time (EST)
○ Central Standard Time (CST)
○ Mountain Standard Time (MST)
● Pacific Standard Time (PST)
○ Clear All

Convert

(b) Conversion from UTC to PST

Figure 2: Application User Interface (Part 2)

Part 2 (50 Points): Using Radio Buttons

The interface should be created to match the user interface presented in Figure 2(a). You will be using layout files, and strings.xml to create the user interface. The layout XML file can be modified through the raw xml, or through the GUI tools provided within eclipse. To build the UI, please follow the following tasks:

1. The string values used for the button labels should be read from the strings.xml file and should not be hardwired in the layout file.
2. Instead of Buttons, Use Radio Buttons and RadioGroup to handle User events. You are asked to properly use Radio Group and Radio Buttons to check which operation is being selected and perform it accordingly when the user clicks the “Convert” button.
3. The app should function similar to the logic described in part 1.