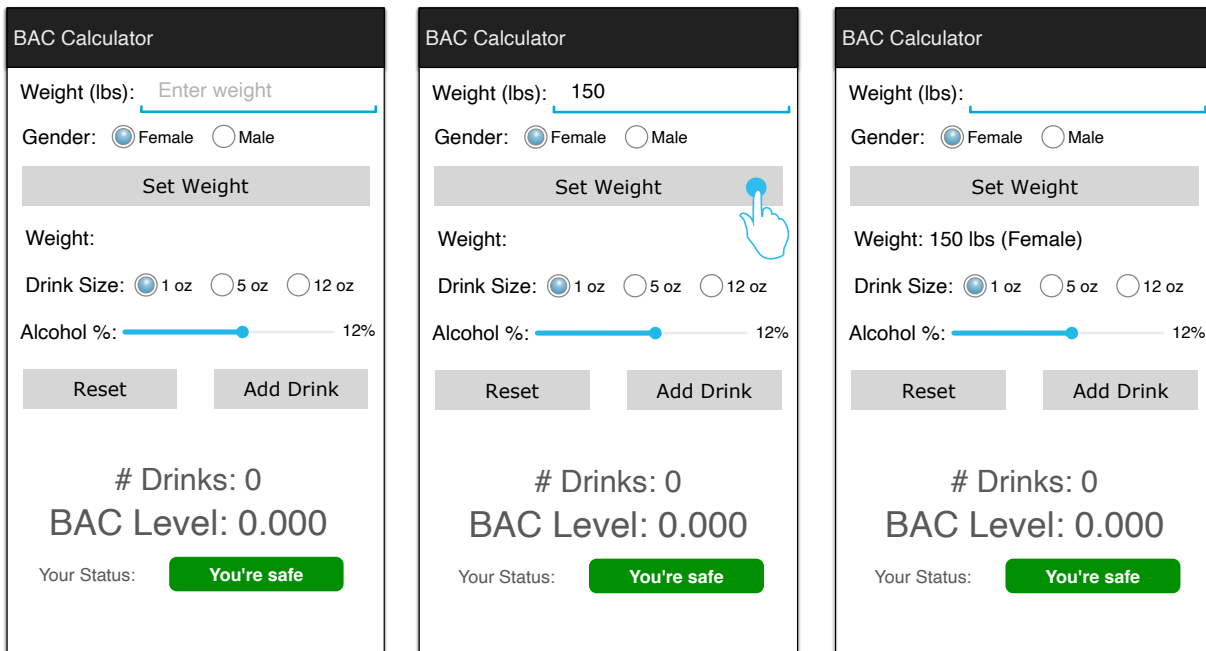


Homework 01 (100 points)

In this assignment you will build your first Android application. You will get familiar with common Android components and how to interact with them. You will build a single activity Blood Alcohol Content (BAC) Level Calculator application.

- You will be using layout files, strings.xml, and drawable files 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.



(a) BAC Start Screen

(b) BAC Setting Weight

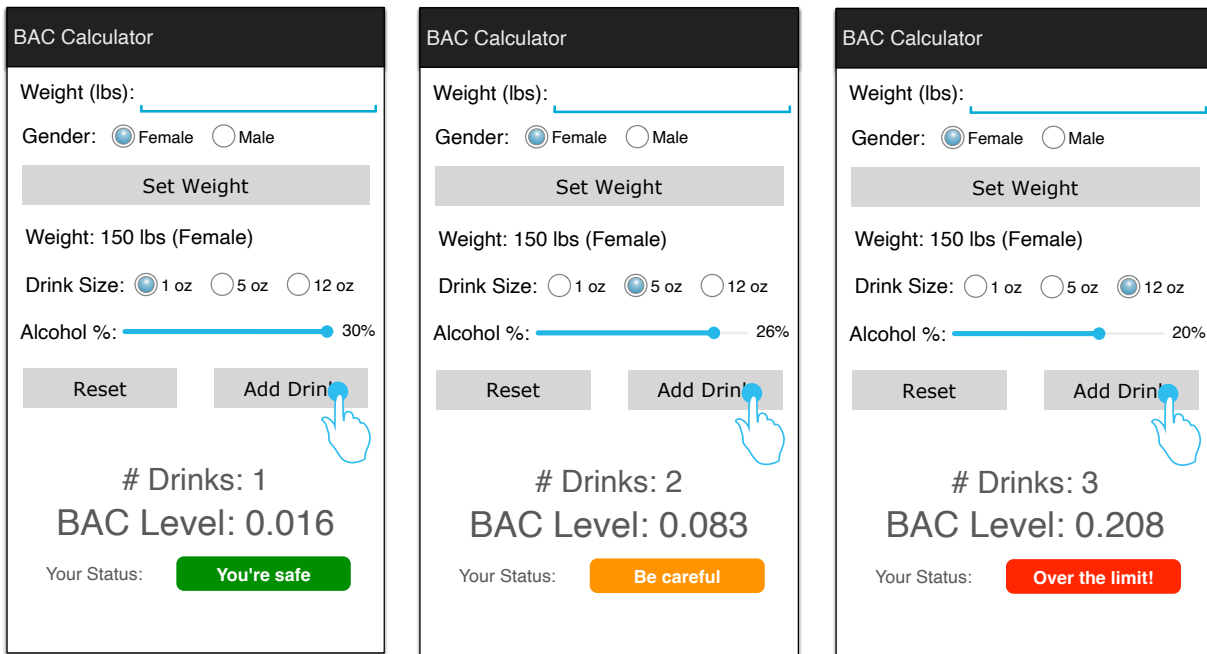
(c) BAC Weight Set

Figure 1, Application Screen Shots

Part 1 (30 Points): Setting Weight and Gender

The interface should be created to match the user interface (UI) presented in Fig 1. This part focuses on enabling the user to setup their weight and gender which is required for BAC calculation. Requirements are listed below:

- The string values used for the text labels, button labels and hints should be read from the strings.xml file and should not be hardwired in the layout file.
- Use an EditText component for the user to enter their weight in pounds, limit the entries to only positive numbers. When the application starts the weight value EditText should be empty, and should display the hint message "Enter Weight" as indicated in Fig 1.
- Use a radio group to allow a user to select their gender.
- Upon clicking the "Set Weight" Button:
 - Display the entered weight and gender as shown in Fig 1(c).
 - Clear the weight EditText.
 - Clear any of the previously added drinks, clear the BAC and UI should be as shown in Fig 1(c).



(a) BAC after 1st Drink

(b) BAC after 2nd Drink

(c) BAC after 3rd Drink

Figure 2, Application Screen Shots

Part 2 (70 Points): Adding Drinks and BAC Calculation

The interface should be created to match the user interface (UI) presented in Fig 1. Requirements are listed below:

- The user should only be allowed to add drinks after they have set their weight and gender. If a user attempts to add a drink before setting their weight and gender show a Toast message asking them to set their weight and gender.
- The Drink Size Radio Group allows the user to pick the drink size 1, 5 and 12oz.
- The Alcohol % is entered through a SeekBar as shown in Fig 2(a). Set the maximum alcohol percentage to 30%.
 - On the right of the SeekBar use a TextView to display the current progress of the SeekBar, which should update as the user moves the SeekBar.
- Clicking the "Add Drink" Button should:
 - The selected Drink Size and the Alcohol % should be used to add a new drink to the list of maintained drinks. (Hint: You can use an ArrayList to maintain a list of the added drinks).
 - Update the number of drinks to show the new number of drinks.
 - Calculate the new BAC value based on the BAC calculation equation listed below.
 - Update the "Your Status" to the correct text and color based on the following:
 - $0 \leq \text{BAC} \leq 0.08$: Green "You're safe."
 - $0.08 < \text{BAC} \leq 0.2$: Orange "Be careful."
 - $0.2 < \text{BAC}$: Red "Over the limit!"
 - Whenever the BAC level reaches 0.25, the "Add Drink" buttons should be

- disabled and display a Toast that says “No more drinks for you.”
5. Clicking the “Reset” button should
 - a. Clear all the added drinks history. (Hint: Clear the ArrayList of added drinks).
 - b. Reset the UI to the state shown in Fig 1(a)
 - c. Enable the “Add Drink” button

Calculating BAC:

- The Blood Alcohol Content (BAC) is calculated based on their user’s weight, gender and alcohol consumption. We are not including time in this calculation.
- The simplified version of the “Widmark BAC Formula:” $\% \text{ BAC} = (A \times 5.14 / (W \times r))$

Variable	Description
A	Total liquid ounces of alcohol consumed. It is dependent of the volume and the alcohol concentration of the drinks consumed.
W	Weight of the person in pounds.
R	Constant that depends on the user’s gender <ul style="list-style-type: none"> - 0.73 for Men - 0.66 for Women

Table 1: BAC variable description

Example Scenario:

Eve consumed 12oz Beer (5%), 5oz Wine Glass (12%), and 1.5oz Spirit (40%). She weighs 150 lbs. In order to calculate the variable A we need to perform the following:

$r = 0.66$ (Women)

$W = 150$ lbs

$A = 12 \times 5 / 100 + 5 \times 12 / 100 + 1.5 \times 40 / 100 = 1.8$

$\text{BAC} = 1.8 \times 5.14 / (150 \times 0.66) = 0.093$