CS-639 Building User Interfaces, Fall 2019, Professor Mutlu

Assignments — Week 11 | Design | Designing for Accessibility

In this assignment, we will explore some of the concepts we learned about in class around *accessibility*. Specifically, we will try to better understand how accessible design and assistive technologies are implemented in existing mobile platforms and design accessibility features for our Module 2 deliverable fitness app. You will choose a mobile platform and analyze its accessibility features and build on this understanding to specify similar features for your app. You may have to do some online research map impairments to design requirements, as how the accessibility features on the mobile platform work in different situations may not be clear. The premise of the assignment to think about how accessibility features work at the lower level and how we might implement them in our designs, so your focus should be on the mappings between impairments and accessible design features. You can be creative with your designs, but they should also be feasible (e.g., enlarging buttons is feasible, but predicting calories from a photo is not).

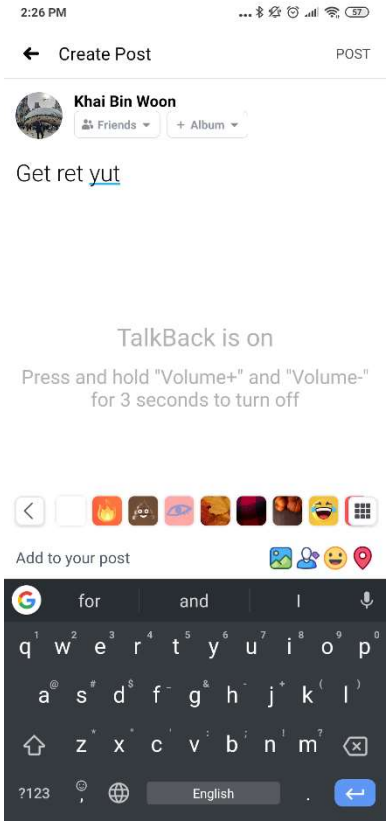
Part 1. Discovery. In this part of the assignment, you will discover the accessibility features of mobile platforms. You will choose (1) *a mobile platform*, such as a mobile device or a tablet computer, running running iOS, Android, or an alternative operating system and (2) *an existing app* from any domain (e.g., fitness, weather, social media, news). Analyze the accessibility features in the general settings of the device to choose one from each of (a) *vision*, (b) *physical/motor*, and (c) *hearing* assistive technologies. Define a core task for the app (e.g., entering food into a fitness app, adding a new city into the weather app, posting on social media, or adding a new news feed) and perform the task a total of four times, first with all accessibility features disabled and then by enabling them one by one. Analyze how the app behaves differently with each assistive technology and describe the changes you noticed either in narrative form, dedicating one paragraph for each assistive technology, or using annotated screenshots. Pay particular attention to (1) any changes in how the components appear and behave and (2) the addition of other components, elements, or behaviors.

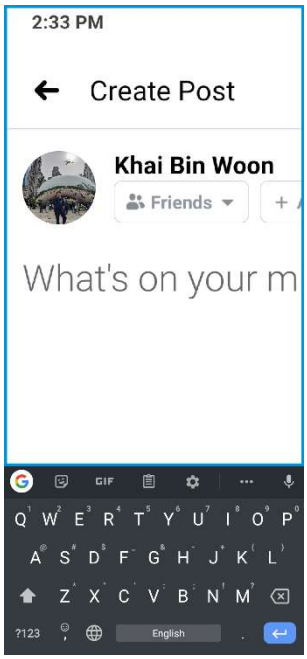
<choice-of-platform-app-task>
Facebook, adding a new post

<choice-of-asssistive-technologies>
TalkBack
Magnifying
Color correction/inversion
One-handed assist

<analysis-in-narrative-or-annotated-screenshot-form>

The talk back function helps those with blindness nothing really changes component wise visually, other than the text or button or component the user highlight or put their finger over is encased in a neon green box. The text or alt-text inside is spoken to the user. Even the letter typed out as well as the whole word is spoken out when the user presses space bar. Words that doesn't make sense is also spoken out loud. When highlighted the profile picture, the TalkBack function would say something like "Button, click to go to user profile"

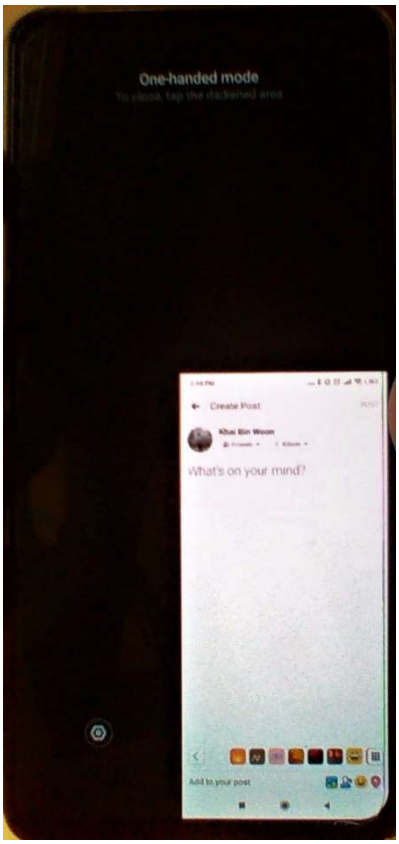




The magnifying function would help users with a bad eyesight reading smaller texts, like from old age etc. The component or text isn't wrapped probably because how it works is just enlarging certain parts of the screen, Or that they enlarge the screen that it overflows, the only thing that isn't enlarged is the keyboard.

The color correction and color inversion to help those with color disabilities doesn't show up when I screenshot with the phone. But when using the color blindness helper, which is red- green and blue-yellow, there isn't much difference between the two other than the tint. This also shows that the design already have the visual impairment in mind, not putting red and green colors together etc. , for example, the the text field is a simple black and white and there is little to no buttons, so that the design is minimalistic and won't have the need to color it.

If a person is using a phone with only one hand, it wil be hard to reach the other end of the screen, expecially the other top corner of the screen, not to mention typing on the keyboard with one thumb. The one-handed assist shrinks the screen so that the user can reach everything on the screen easier. The size of the components however is unchanged to keep the aspect ratio of the screen. The gesture to perform the action and switch between the modes is easy to perform also.



Part 2. Design. In this part of the assignment, you will build on your understanding of how assistive technologies work from Part 1 to practice accessible design for your fitness app. You will choose one *permanent impairment* and one *situational impairment* that you would like to target with your app. Determine the design requirements (what should the app do or not do to offer users with these impairments a similar experience) for each impairment using one or a combination of the following: (1) your observations of how assistive technologies worked in Part 1; (2) quick-and-dirty online research you can do about the effects of these impairments on mobile device use; and (3) novel ways in which you can

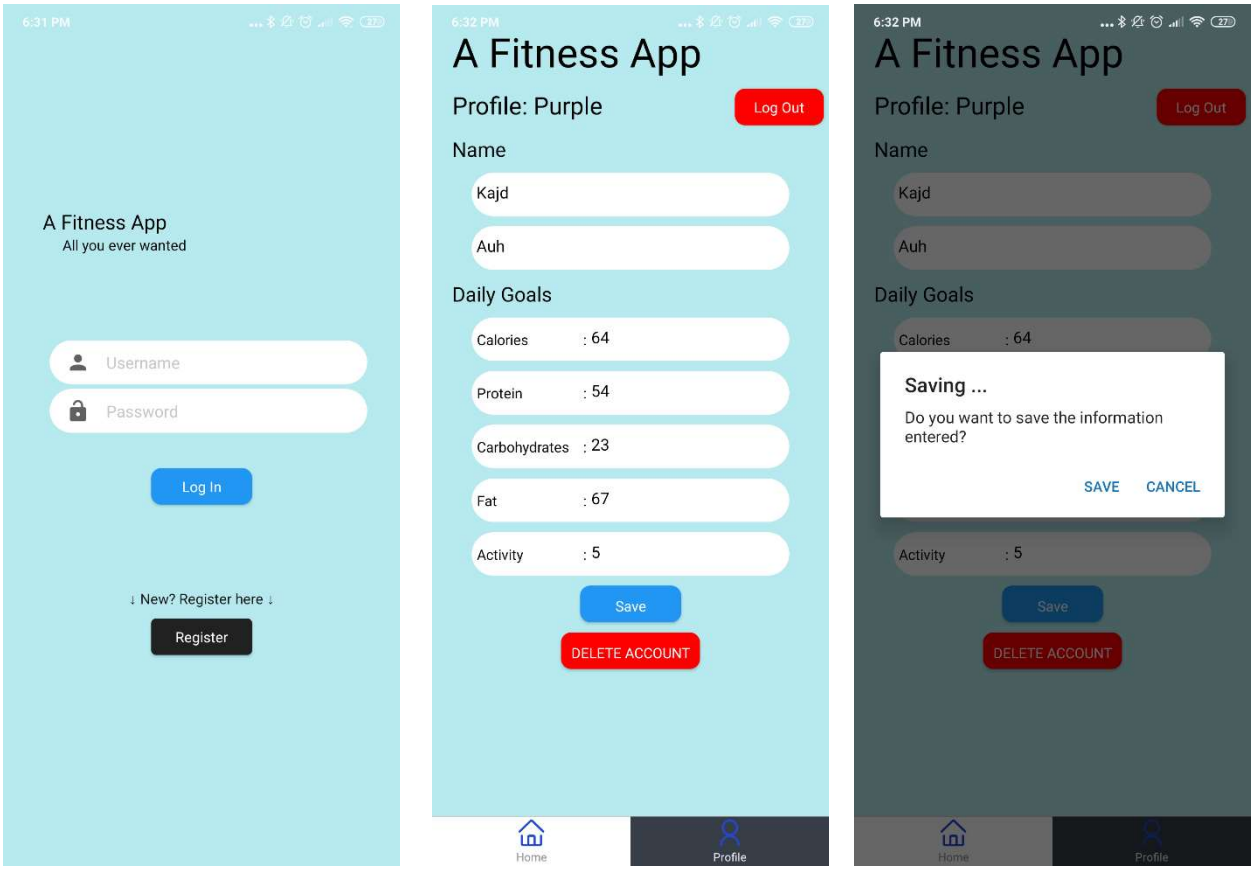
think of addressing the impairments. Choose a task that your app will support and prepare wireframe screenshots (1–3 screens, depending on the task) of your app, demonstrating the task. Create two additional versions of the screenshots that implement accessible design features for the impairments. Annotate these versions to highlight and describe the features.

<choice-of-impairments>
Color blindness
<design-requirements>
Avoid design choices that would lead to difficulty in differentiating between components or function, e.g. avoid using green for go and red for stop.
List of color pairs to avoid in symbolizing function:

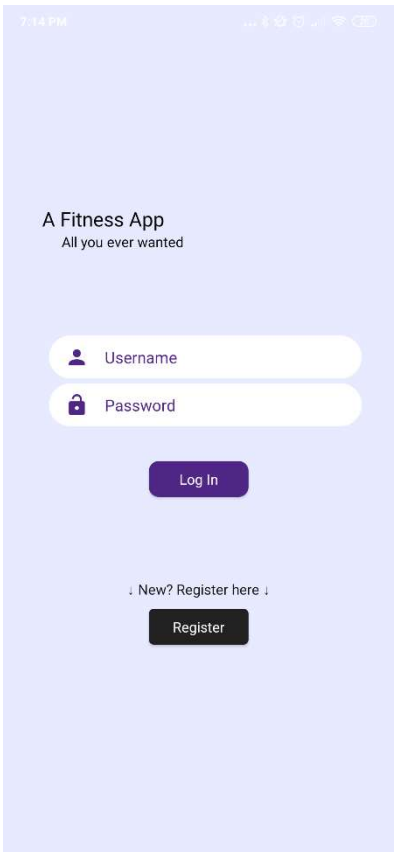
- Red & green.
- Green & brown.
- Green & blue.
- Blue & gray.
- Blue & purple.
- Green & gray.
- Green & black.

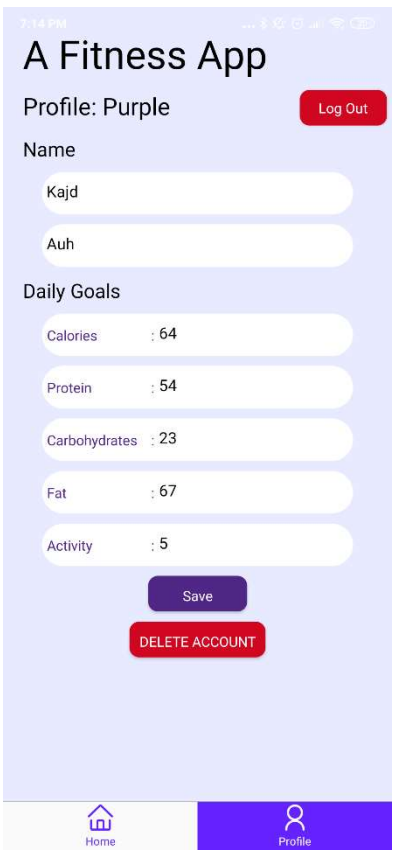
<annotated-wireframes>
Task: Login, update profile, for example, names, daily goals, etc., then logs out

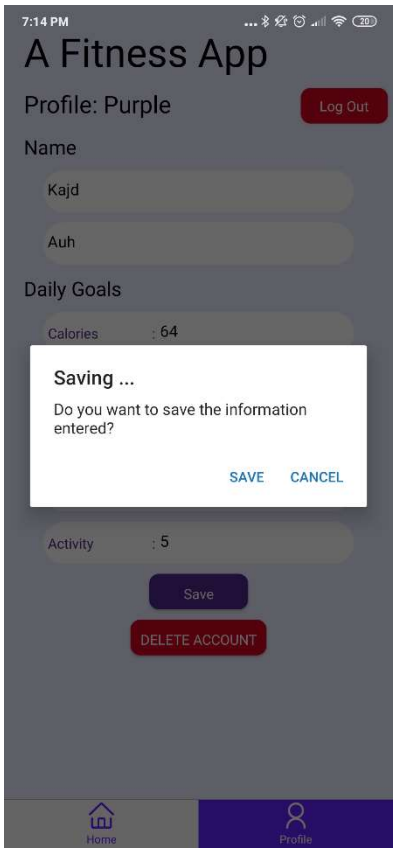
Screenshots on next page.



Right now, the default text is grey and the background and buttons are blue, not to mention the login button blends with the background if the user couldn't see the difference between blues. The color of the bottom navigation tab also needs fixing as it is blue and grey, which is one of the color pair to avoid.







A simple way to solve the issue is to update the colors used in the app. The biggest update is the default text color and the bottom tab navigation, I am still not sure is the background color is the best choice, but now the app's color scheme is based on the contrast of purple and white, where there wont be any blue or greys. Not to mention the dangerous buttons are red which does not conflict with purple.