Mobile Application Assignment 1

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Be sure to click on the links in this doc to view more information about certain topics. These may or may not help you in your lab, but can always provide some extra context and information.

Initial Setup

1. Start Android Studio and create a new project.
    - Application name: Assignment 1
    - Company domain: `mobileapps.techexchange.com`.
    - Be sure to create a project for a phone/tablet running at least API 26.
2. Delete the `androidTest` and `test` directories from your project completely.
3. Open the AVD Manager, and launch a new Android Virtual Device running Android Oreo.
4. Build and run your newly created project on the Virtual Device.

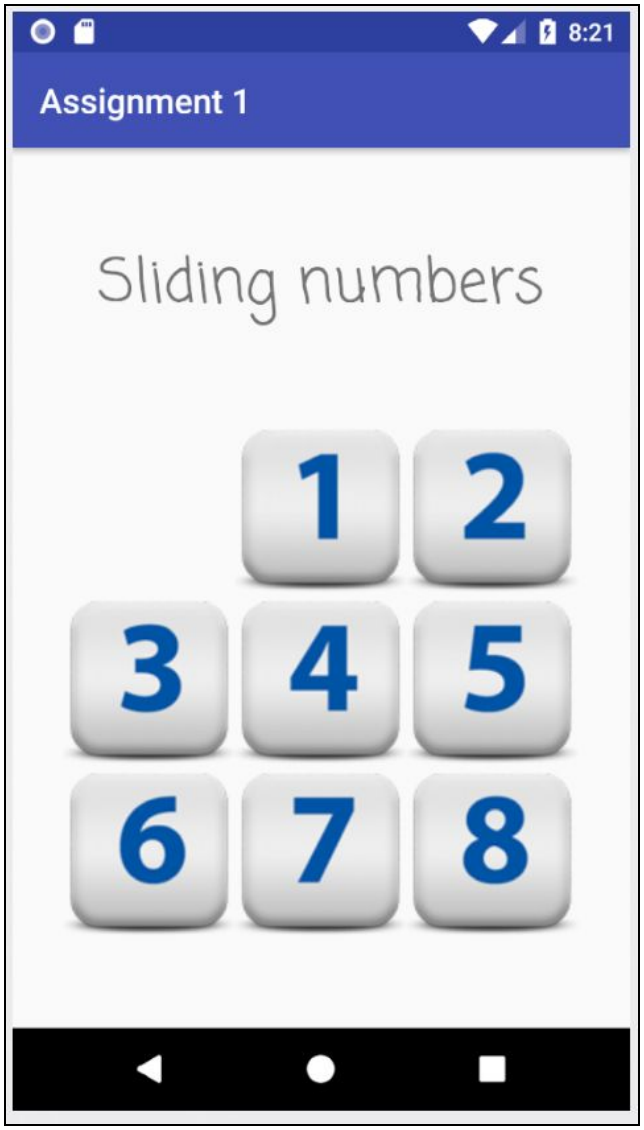
Deliverables and Requirements

For this assignment, you will be creating a simple one-player game for sliding number tiles into the correct order. Before getting started, try out the game, and see what you will be implementing.

Here are some ways in which your app will differ from the web version:

- You will only be implementing the 3x3 grid version of the game, containing numbers from 1 to 8.
- Do not display any messages unless the order is correct AND the empty space is in the correct position.
- The message displayed in the winning position should be a Toast message.
- When the player's tiles are in the winning position, the tiles should turn green and future moves should be prohibited.

Your app's initial UI should look something like this:



The order of the numbers in this screenshot is pretty simple, but it should be jumbled up.

Implementation Guidelines

For this assignment, you should get comfortable with reading available documentation for things that look similar to what you have seen so far, but not worked with directly before.

You will be dealing with a new kind of View for this assignment: ImageView. The tiles for this assignment will need to be drawn as images. You can use this sprite sheet to get the images required for this assignment. A sprite sheet is simply a single image containing multiple related images, often arranged in a regular grid for easy cropping. Note that the sprite sheet contains both blue, grey and green tiles for all single-digit numbers.

Image files are considered drawable resources. Placing the file in the correct directory in your project will cause it to be automatically packaged as a resource that can then be referenced from the Java code for the application.

More classes to look at while working with ImageView are Bitmap and BitmapFactory.

A layout you might want to consider using for this assignment is the GridLayout. Remember: you can place layouts within layouts, so you could potentially have a GridLayout as a child of your top-level ConstraintLayout.

Remember to use the Model View Controller design pattern for this assignment. You should clearly define your model class(es) and views separately, with only the Controller (your Activity).

Also remember that not every game state for this slider game is solvable! You should not randomize the order of the tiles naively, but should do it in a way that the user can then solve. There are two possible ways of doing this:

1. Load a set of valid initial grid states from a file stored as a resource.
2. Programmatically jumble up the tiles by doing a large number of legal random moves at the start.