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# Assignment 2

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<https://github.com/USI-Projects-Collection/MWCTutorial04.git>

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# 1 Exercise 1 – Android Basics

## 1. What does the `android:minSdkVersion` in an Android project indicate?

The `android:minSdkVersion` attribute specifies the minimum Android OS version that the app can run on. It ensures that the app will only be installable on devices with an OS version *equal to or higher* than the declared version. For example, if `minSdkVersion` is set to 21, the app will only work on devices running Android 5.0 (Lollipop) or newer.

## 2. Why does Android documentation indicate that declaring the attribute `android:maxSdkVersion` is not recommended?

The Android documentation advises against using `maxSdkVersion` because it restricts the app's availability for future Android versions. If this attribute is set, the app won't be available for users running newer versions of Android, even if it could still work. This can cause compatibility and distribution issues as new Android versions are released.

## 3. What are the two types of Navigation Drawer? Explain the differences between the two types.

There are two types of Navigation Drawer in Android:

- **Permanent Navigation Drawer:** This type is always visible alongside the app's content, often used in tablet layouts or on large screens. The main content of the app is displayed next to the drawer.
- **Modal Navigation Drawer:** This type is hidden by default and slides in over the app's content when triggered. It is commonly used in mobile apps where screen space is limited.

**Differences:** The permanent drawer is better suited for larger screens where space is not an issue, while the modal drawer is more suitable for smaller screens, as it saves space by presenting the drawer as an overlay.

## 2 Exercise 2 – Material Design

### 2.1 Change App Icon

To change our app's icon, I used Android Studio's built-in feature to generate icons (see Figure 1). I navigated to the `res` folder, right-clicked on the `drawable` folder, and selected *New* → *Image Asset*. After selecting the image I had previously imported, Android Studio automatically generated the required icons.

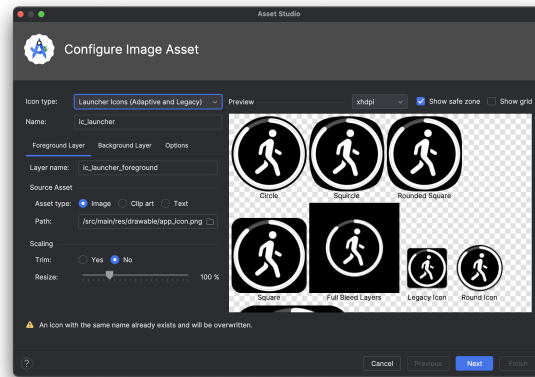


Figure 1: Generating Icons in Android Studio

Android Studio handled the generation of all necessary formats for the image, including various resolution sizes and shapes (see Figure 2).

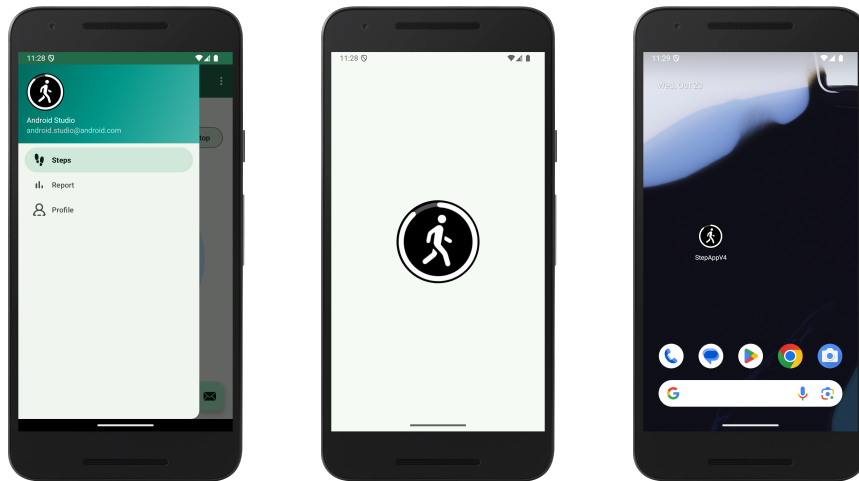


Figure 2: Generated Icons with Different Resolutions and Shapes

## 2.2 Implement Dark Theme

To implement the dark theme, I utilized the `AppCompatActivity` class provided by Android's support library. This allows for easy switching between light and dark modes. The dark mode can be toggled by the user via a switch placed in the `Profile` page (see Figure 3).

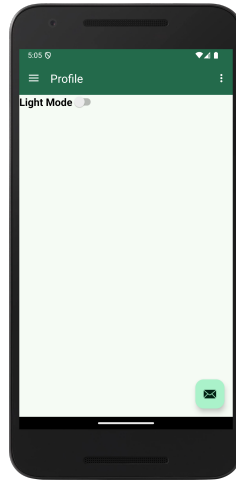


Figure 3: Switch for toggling between Light and Dark Modes

The dark mode implementation involved modifying the `ProfileFragment` and adding an `OnCheckedChangeListener` to the switch. Depending on whether the switch is checked or not, the theme is switched using `AppCompatActivity.setDefaultNightMode()`. If the switch is turned on, the dark theme is enabled using `AppCompatActivity.MODE_NIGHT_YES`, and if the switch is off, the light theme is restored using `AppCompatActivity.MODE_NIGHT_NO`.

The relevant code for the theme switching logic is shown below:

```
private void updateSwitchText() {
    int currentNightMode = getResources().getConfiguration().uiMode & android.content.res.Configuration.UI_MODE_NIGHT_YES;
    if (currentNightMode == android.content.res.Configuration.UI_MODE_NIGHT_YES) {
        // Dark mode is active
        darkModeSwitch.setChecked(true);
        darkModeSwitch.setText("Dark Mode");
    } else {
        // Light mode is active
        darkModeSwitch.setChecked(false);
        darkModeSwitch.setText("Light Mode");
    }
}
```

Additionally, I ensured that the `colors.xml` file contained separate color definitions for both light and dark modes. This file is located in the `res/values` and `res/values-night` directories for light and dark modes, respectively. Same thing I had to do for the Themes, this prevented the app from changing layout changes. The following figures are some screenshots of the app in dark mode (see Figure 4).



Figure 4: Generated Icons with Different Resolutions and Shapes

### 3 Exercise 3 – Step Counter