Lecture 03: Uer Interfaces & Material Design
IN721: Mobile Application Development
Semester One, 2020

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Lecture 02: Activities & Intents Topics

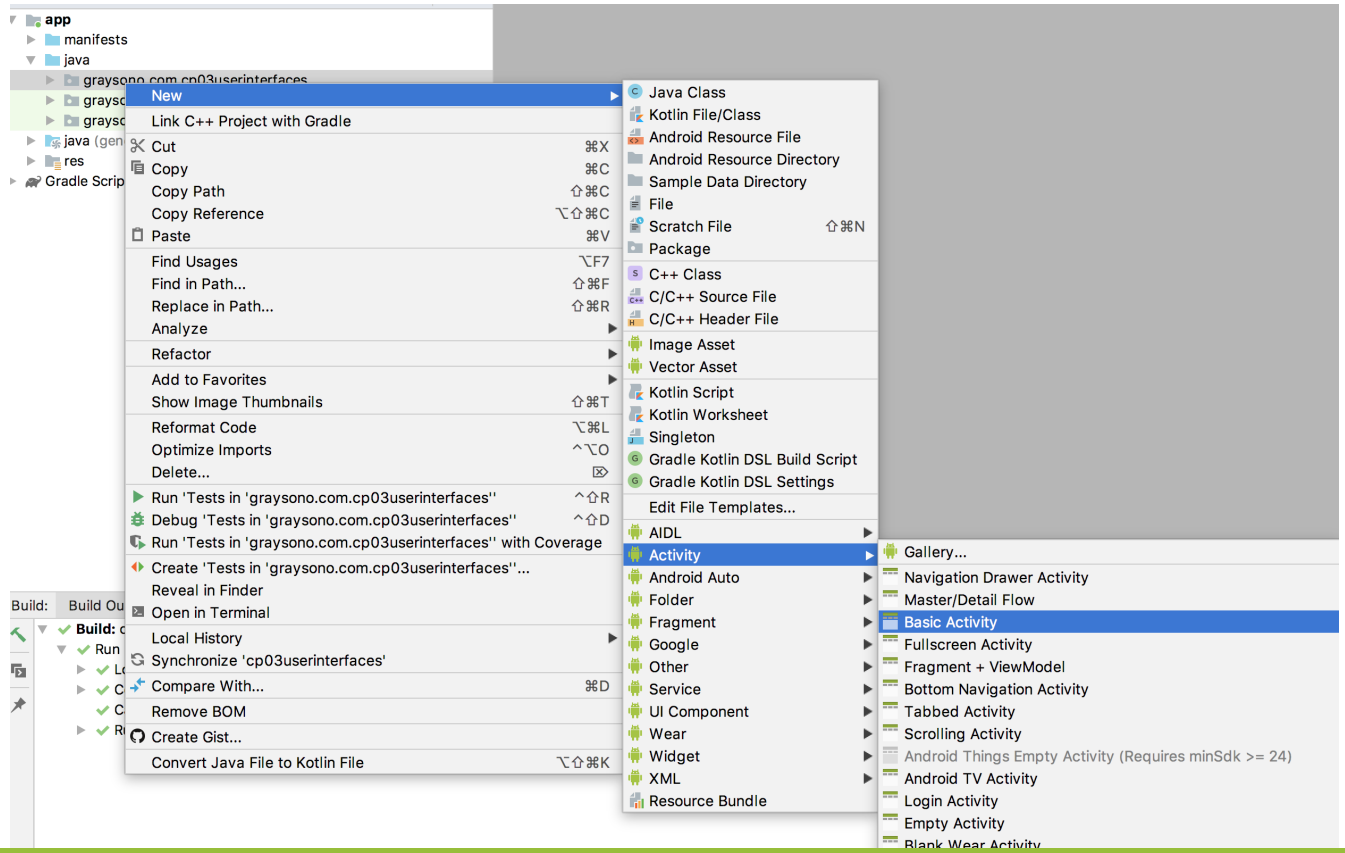
- Activities
- Intents
  - Data passing
  - Implicit
  - Explicit
- OnBackPressed
- String placeholder

Lecture 03: User Interfaces & Material Design Topics

- Basic activity
- BottomNavigationView
- Menus
- Splash screen
- Material design

Basic Activity

- Create a new basic activity
- A menu resource directory & menu XML file will be generated
- A activity & content XML file will be generated
  - Activity XML file references the content XML file
  - Add widgets to the content XML file



MainActivity.kt

- onCreateOptionsMenu
- onOptionsItemSelected

```
class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        setSupportActionBar(toolbar)
        val fab = findViewById<FloatingActionButton>(R.id.fab)
        fab.setOnClickListener(YouTubeButtonOnClickListener())
    }

    override fun onCreateOptionsMenu(menu: Menu): Boolean {
        menuInflater.inflate(R.menu.menu_main, menu)
        return true
    }

    override fun onOptionsItemSelected(item: MenuItem): Boolean {
        return when (item.itemId) {
            R.id.action_settings -> true
            else -> super.onOptionsItemSelected(item)
        }
    }

    inner class YouTubeButtonOnClickListener : View.OnClickListener {
        override fun onClick(view: View) {
            startActivity(Intent(Intent.ACTION_VIEW,
                Uri.parse( uriString: "https://www.youtube.com")))
        }
    }
}
```

Menus: Toolbar

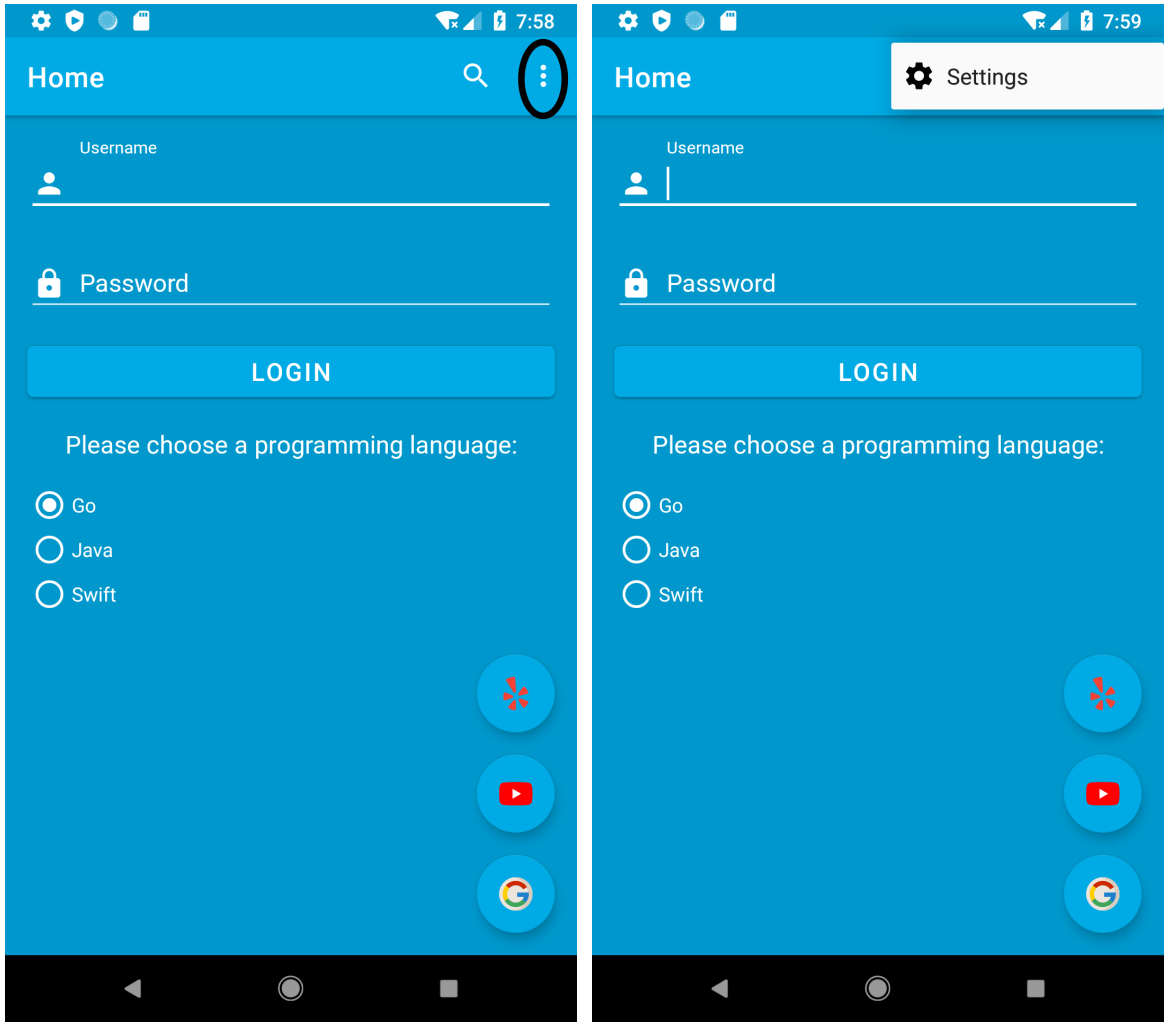
- menu_main.xml
- <menu> tag
- <item> tag

menu_main.xml

```
1  <menu xmlns:android="http://schemas.android.com/apk/res/android"
2      xmlns:app="http://schemas.android.com/apk/res-auto"
3      xmlns:tools="http://schemas.android.com/tools"
4      tools:context="com.example.graysono.test.MainActivity">
5      <item
6          android:id="@+id/action_settings"
7          android:orderInCategory="100"
8          android:title="Settings"
9          app:showAsAction="never" />
10 </menu>
```

Menus: Toolbar

- Vertical ellipsis
- Click to show menu items



BottomNavigationActivity.kt

- Create a new empty activity
- You can create a bottom navigation activity, but generates a lot of boilerplate. We won't do this

```
class BottomNavigationActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_bottom_navigation)

        val bnv = findViewById<BottomNavigationView>(R.id.bnv)
        bnv.setOnNavigationItemSelectedListener(OnNavigationItemSelectedListener())
        bnv.menu.getItem( index: 1).isChecked = true
    }

    inner class OnNavigationItemSelectedListener : BottomNavigationView.OnNavigationItemSelectedListener {
        override fun onNavigationItemSelected(item: MenuItem): Boolean {
            return when (item.itemId) {
                R.id.navigation_home -> {
                    startActivity(Intent( packageContext: this@BottomNavigationActivity,
                        MainActivity::class.java))
                    true
                }
                R.id.navigation_dashboard -> true
                else -> onNavigationItemSelected(item)
            }
        }
    }
}
```

Activity Bottom Navigation XML

- BottomNavigationView widget

activity_bottom_navigation.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:id="@+id/container"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingTop="?attr/actionBarSize">

    <com.google.android.material.bottomnavigation.BottomNavigationView
        android:id="@+id/bnv"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_marginStart="0dp"
        android:layout_marginEnd="0dp"
        android:background="?android:attr/windowBackground"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:menu="@menu/bottom_nav_menu" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Menus: Bottom Navigation

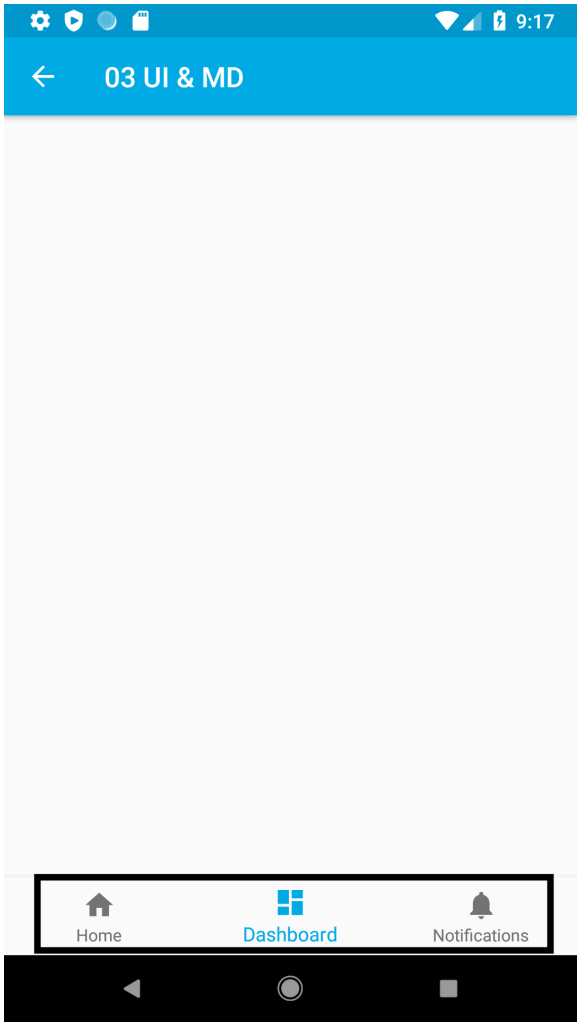
- bottom_nav_menu.xml
- <menu> tag
- <item> tag

bottom_nav_menu.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">

    <item
        android:id="@+id/navigation_home"
        android:icon="@drawable/ic_home_black_24dp"
        android:title="Home" />

    <item
        android:id="@+id/navigation_dashboard"
        android:icon="@drawable/ic_dashboard_black_24dp"
        android:title="Dashboard" />

    <item
        android:id="@+id/navigation_notifications"
        android:icon="@drawable/ic_notifications_black_24dp"
        android:title="Notifications" />

</menu>
```

Menus: Bottom Navigation

- Three menu items as specified in the bottom_nav_menu.xml file



Splash Screen

- Currently, the launcher activity is MainActivity.kt
- Create a new activity called SplashScreenActivity.kt
- Change the launcher activity to SplashScreenActivity.kt in the AndroidManifest.xml

```
<activity
    android:name=".SplashActivity"
    android:theme="@style/AppTheme.NoActionBar">
    <intent-filter>
        <action android:name="android.intent.action.MAIN" />
        <category android:name="android.intent.category.LAUNCHER" />
    </intent-filter>
</activity>
```

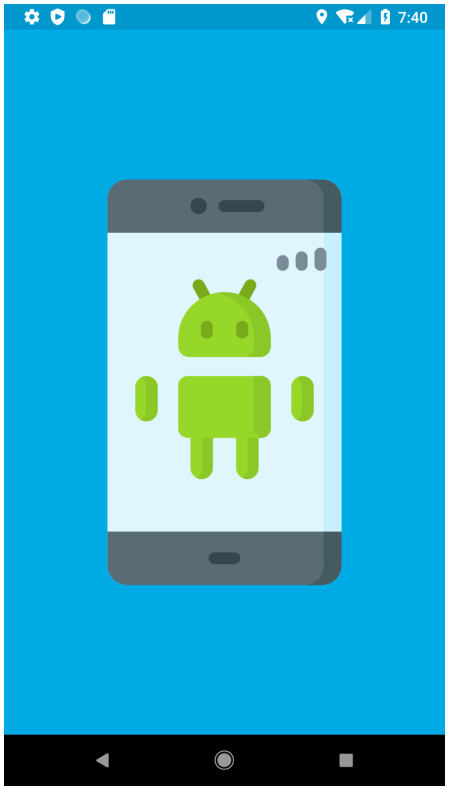
Splash Screen

- postDelayed
  - Causes the runnable to be added to the message queue
  - Run after a specified amount of time elapses

```
class SplashActivity : AppCompatActivity() {
    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_splash)
        Handler().postDelayed({
            startActivity(Intent( packageContext: this@SplashActivity, MainActivity::class.java))
            finish()
        }, resources.getInteger(R.integer.sleep).toLong())
    }
}
```

Splash Screen

- Splash screen image - image view widget
- Change from SplashScreenActivity.kt to MainActivity.kt after 3000 milliseconds



Integers Resource XML File

- Integers resource file
  - resources.getInteger(R.integer.sleep).toLong()

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <integer name="sleep">3000</integer>
</resources>
```

Changing Colors

- Default color hex values
- Changing the color hex values

colors.xml

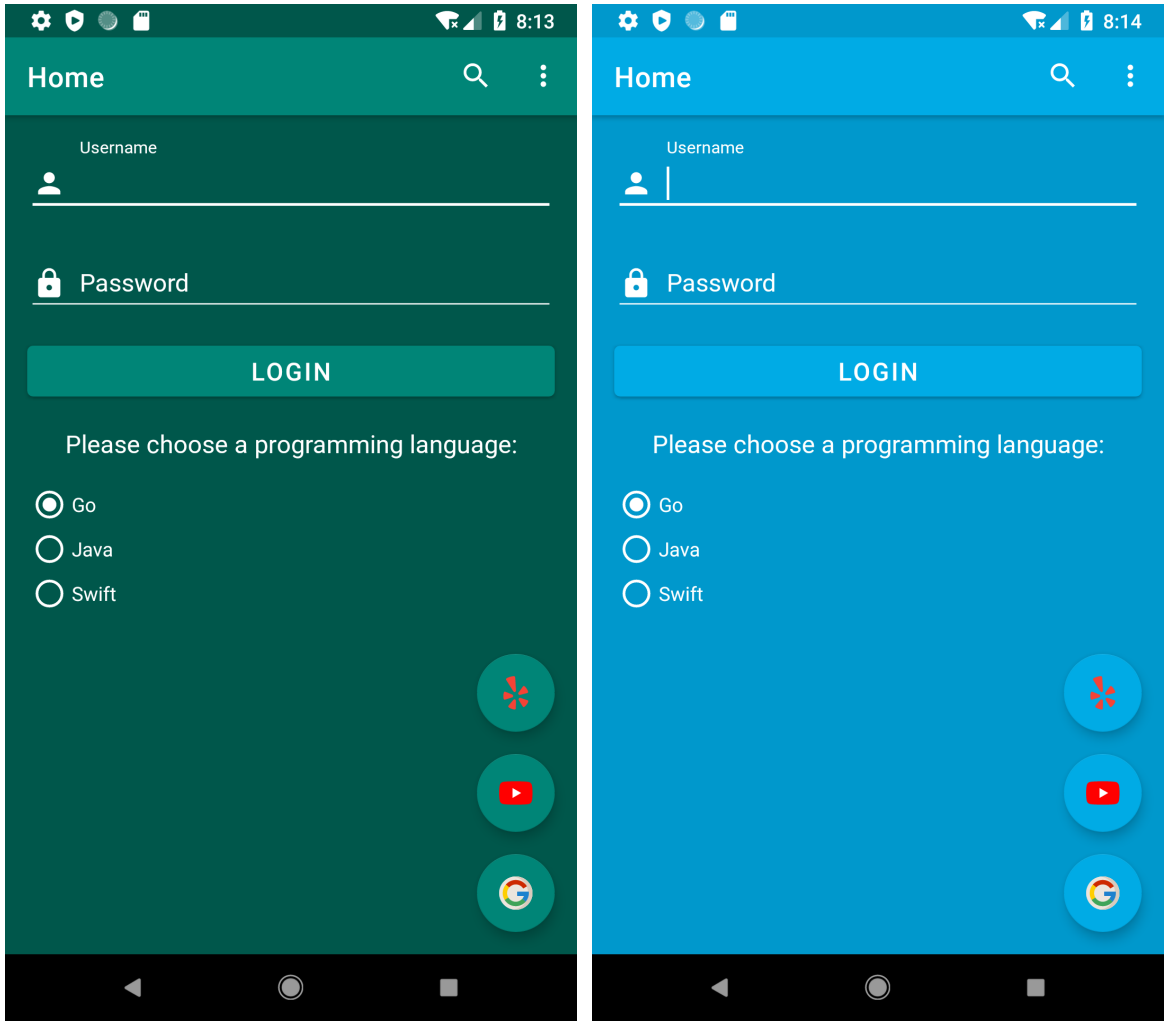
```
1  <?xml version="1.0" encoding="utf-8"?>
2  <resources>
3      <color name="colorPrimary">#008577</color>
4      <color name="colorPrimaryDark">#00574B</color>
5      <color name="colorAccent">#D81B60</color>
6  </resources>
```

colors.xml

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <resources>
3      <color name="colorPrimary">#00ABE5</color>
4      <color name="colorPrimaryDark">#0098CC</color>
5      <color name="colorAccent">#D81B60</color>
6  </resources>
```

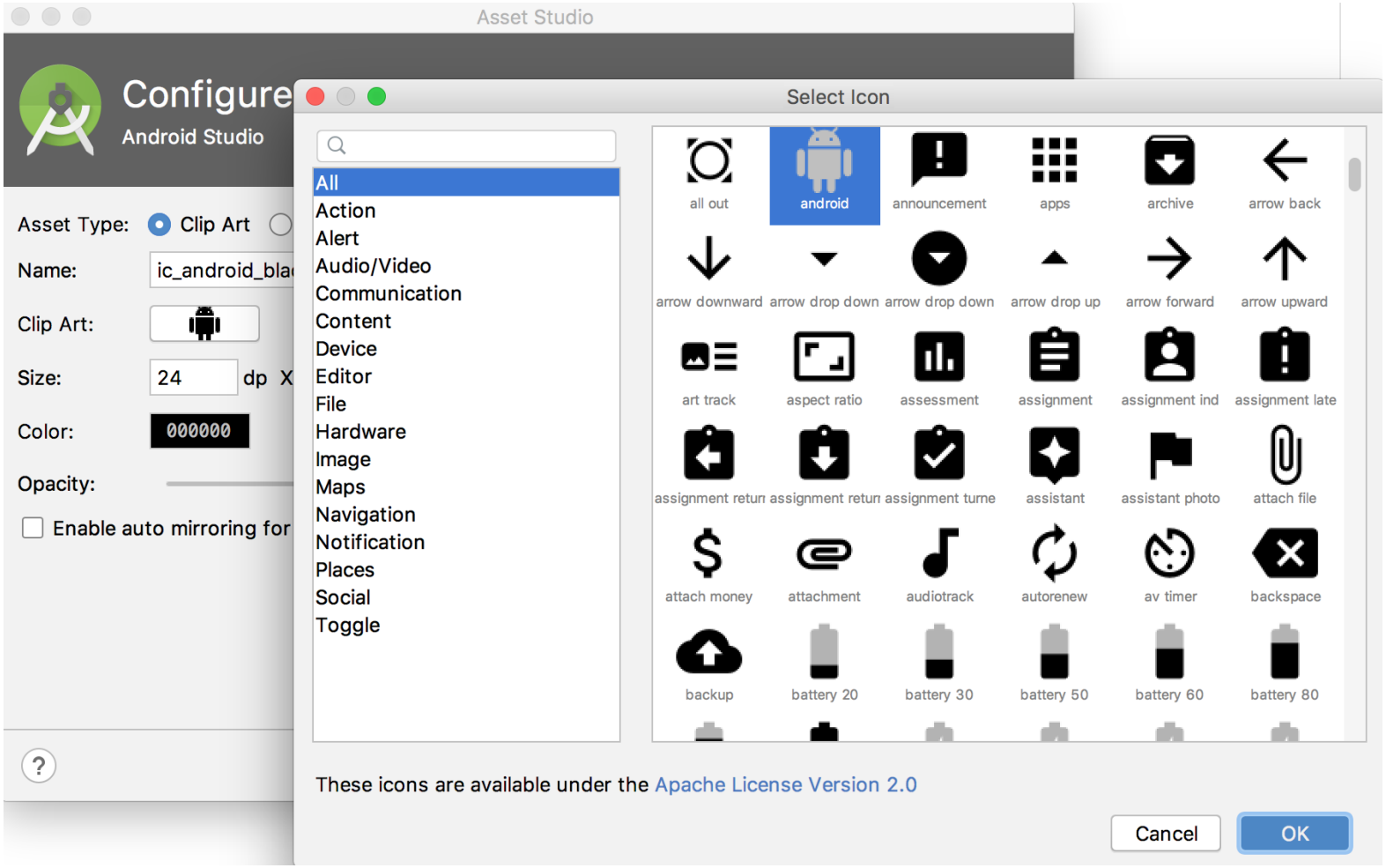
Changing Colors

- Before & after
- Adhere to Material Design best practices



Vector Drawables

- res > drawable > New > Vector Asset

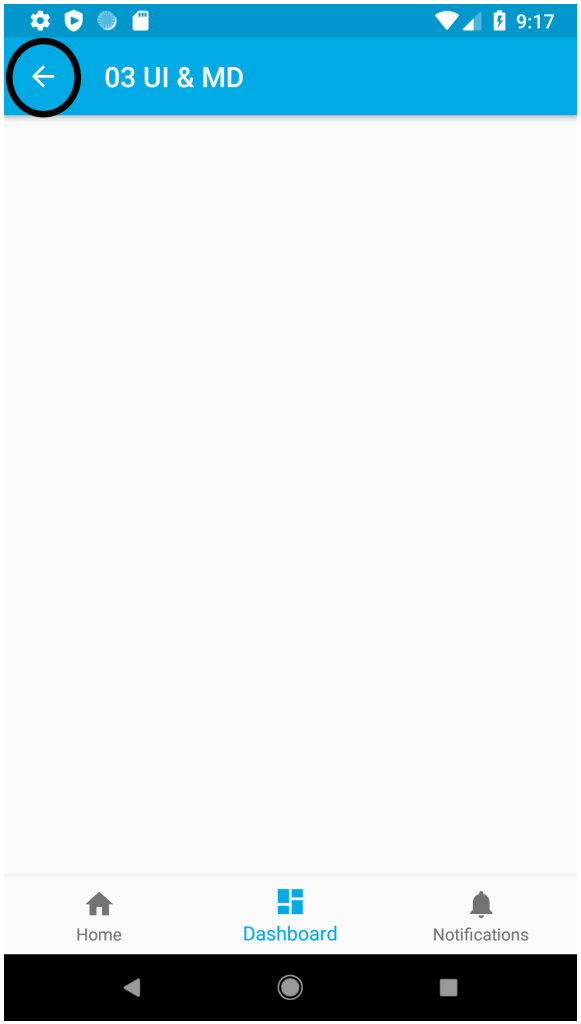


Toolbar Back Button: AndroidManifest.xml

- parentActivityName attribute

```
<activity
    android:name=".BottomNavigationActivity"
    android:label="@string/app_name"
    android:parentActivityName=".MainActivity">
    <meta-data
        android:name="android.support.PARENT_ACTIVITY"
        android:value=".MainActivity" />
</activity>
```

Toolbar Back Button: AndroidManifest.xml



Material Design

- Design system - back by open-source
- Build high-quality digital experiences for Android, iOS and the web
- https://material.io/
- Material Design Components (MDC) tutorials
- build.gradle
  - implementation 'com.google.android.material:material:1.0.0'

Practical

- Series of tasks covering today's lecture
- Worth 1% of your final mark for the Design and Development of Applications for Mobile Devices course
- Deadline: Friday, 12 June at 5pm