CMPS 312 Mobile Application Development
Lab 5 – Compose Components & Layouts

Objective

Practice implementing mobile apps UI using compose components and layouts.

Overview

- **Part A -** Basic layouts in Compose CodeLab
- **Part B -** Implement Tip Calculator App
- **Part C -** Implement Stadiums App

Part A – Jetpack Compose Layouts

Complete the Basic layouts in Compose codelab .

Part B - Tip Calculator App

Implement a Tip Calculator App, as shown in Figure 1, to allow the user to:

- Enter the total bill amount,
- Select one of three service quality options: Okay, Good, and Amazing.
- Depending on the service quality, the app should calculate and display the tip amount.
- The app should also allow the users to round up the tip.

1. Create a new project named `TipCalculator` under `Lab5\TipCalculatorApp` folder on your GitHub repo.
- Use `cmps312.tipcalculator` as the package.
- Select *Empty Compose Activity* as the project template.

2. Implement the TipCalculator offering the UI and features shown in Figure 1.

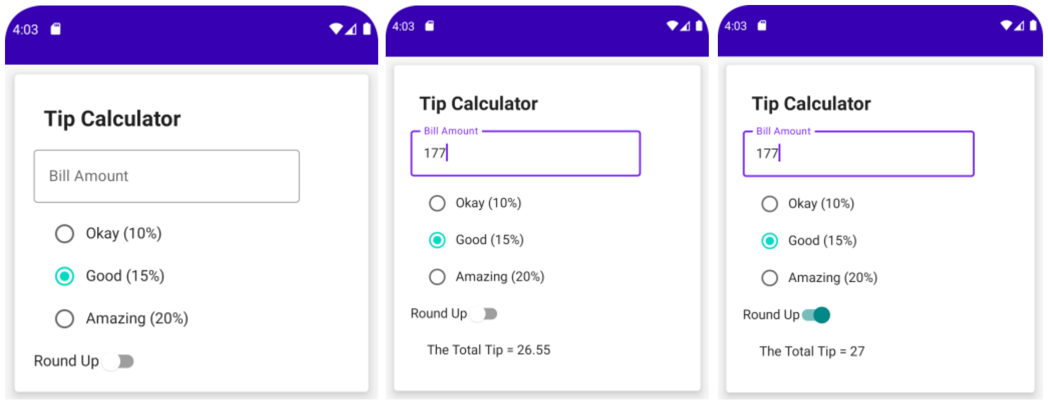
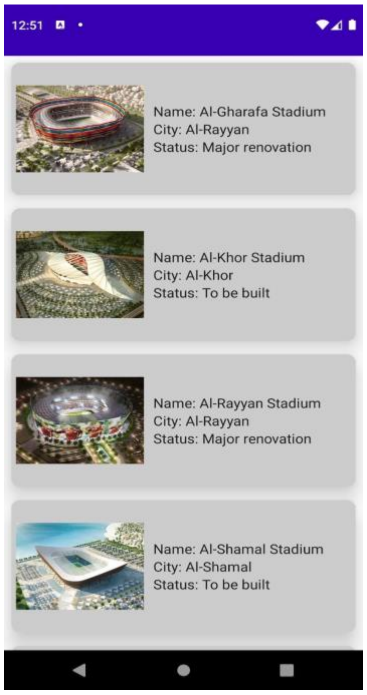


Figure 1. Tip Calculator App

Part C – Stadiums App

Implement the Stadiums App shown in Figure 2 by reading the stadiums details from a JSON file then displaying them in a LazyColumn.



Name: Al-Gharafa Stadium
City: Al-Rayyan
Status: Major renovation

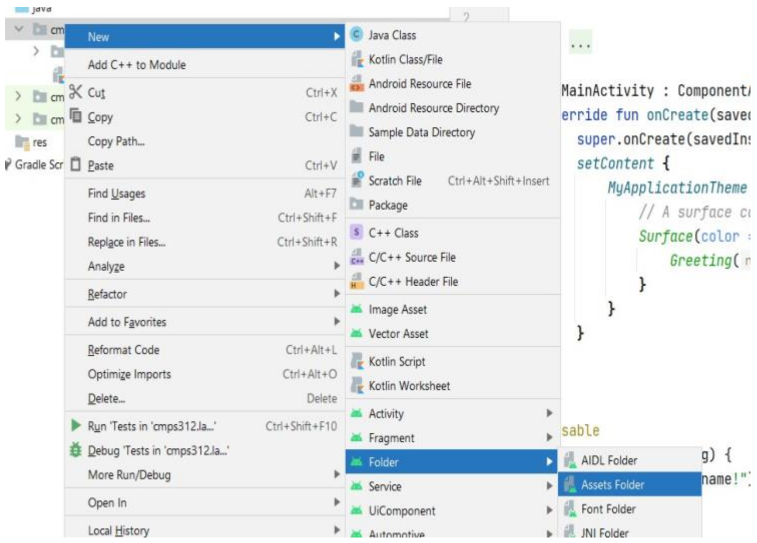
Name: Al-Khor Stadium
City: Al-Khor
Status: To be built

Name: Al-Rayyan Stadium
City: Al-Rayyan
Status: Major renovation

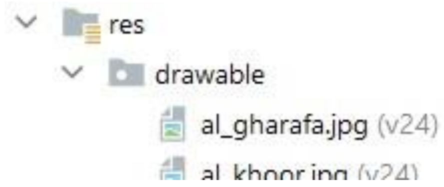
Name: Al-Shamal Stadium
City: Al-Shamal
Status: To be built

Figure 2. Stadiums App

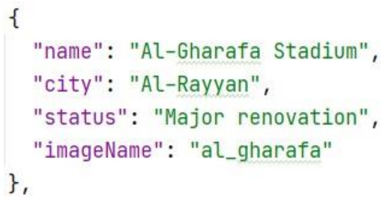
1. Sync Lab GitHub repo to get the resources needed for this project.
2. Create a new project named Qatar Stadiums place it under the **`Lab5\StadiumApp`** folder on your GitHub repo.
   Use `cmps312.stadiumapp` as the package. Select *Empty Compose Activity* as the project template.
   Place all Kotlin files related to the UI under `cmps312.stadiumapp.UI` package and the ones related to the app logic under `cmps312.stadiumapp.model` package.
3. Add the Kotlin serialization dependency to the **module** build.gradle file as explained in the documentation.
4. Create an **assets** folder and add the ***stadium.json*** (available under Lab5 folder)



5. Copy all the stadium images from ***Lab5/images*** folder and paste them to **res>drawable** folder



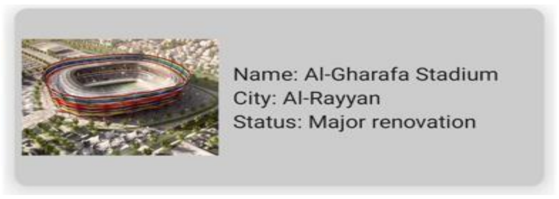
6. Create a data class named **Stadium** (in a Kotlin file named Stadium) and annotate it with `@Serializable`. Derive Stadium properties from the JSON object shown below.



```
{
  "name": "Al-Gharafa Stadium",
  "city": "Al-Rayyan",
  "status": "Major renovation",
  "imageName": "al_gharafa"
},
```

7. Add **`StadiumRepository`** object. Add **`getStadiums()`** function to read the **stadiums.json** file a list of stadiums. Stadiums retrieved from the JSON file should be cached in the `StadiumRepository` object to avoid repetitive reads.
8. Test your `StadiumRepository.`**`getStadiums()`** in the MainActivity and display all the stadiums on the Logcat using Log.d(…).
9. Add a **`StadiumCard`** Kotlin file and implement **`StadiumCard`** composable to display a stadium, as shown in Figure 3.

   Tip: add appropriate modifiers and properties such as elevation, shape to achieve the desired design.



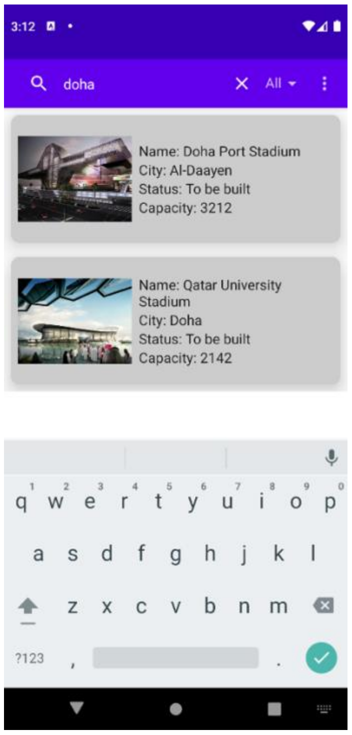
Name: Al-Gharafa Stadium
City: Al-Rayyan
Status: Major renovation

Figure 3. Stadium Card Composable

10. Add **`StadiumCardPreview`** composable function to test the **`StadiumCard`** composable using AlGharafa Stadium details as shown in Figure 3.
11. Create **`StadiumList`** Kotlin file and implement **`StadiumList`** composable to display the stadiums returned by `StadiumRepository.`**`getStadiums()`** in a `LazyColumn`.
12. Add **`StadiumListPreview`** composable to test the **`StadiumList`** composable as shown in Figure 2.
13. Load the **`StadiumList`** in the MainActivity, then test the whole app.
14. Experiment with changing `LazyColumn` to `LazyRow` and retest your app.

Remember to test as you go and push your work to the GitHub repository once completed.

15. As shown in Figure 1, add a Top App Bar with Search Box to allow users to search stadiums.



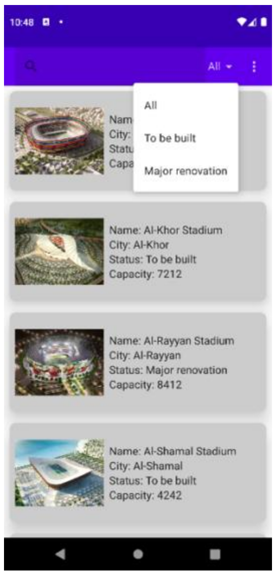
doha

Name: Doha Port Stadium
City: Al-Daayen
Status: To be built
Capacity: 3212

Name: Qatar University Stadium
City: Doha
Status: To be built
Capacity: 2142

Figure 1.Search stadiums

16. As shown in Figure 2, add a Dropdown list to allow filtering the stadiums based on their status (To be built, Major Renovation or All).



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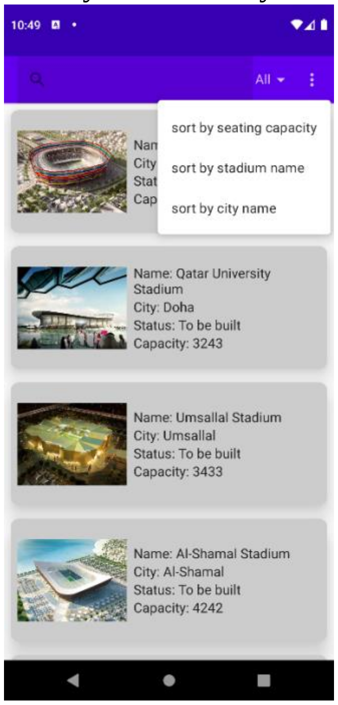
Name: Al-Khor Stadium
City: Al-Khor
Status: To be built
Capacity: 7212

Name: Al-Rayyan Stadium
City: Al-Rayyan
Status: Major renovation
Capacity: 8412

Name: Al-Shamal Stadium
City: Al-Shamal
Status: To be built
Capacity: 4242

Figure 2. Filter stadiums based on status

17. As shown in Figure 3, Create a sort menu that sorts the stadiums based on seating capacity, and alphabetically based on city and stadium name.



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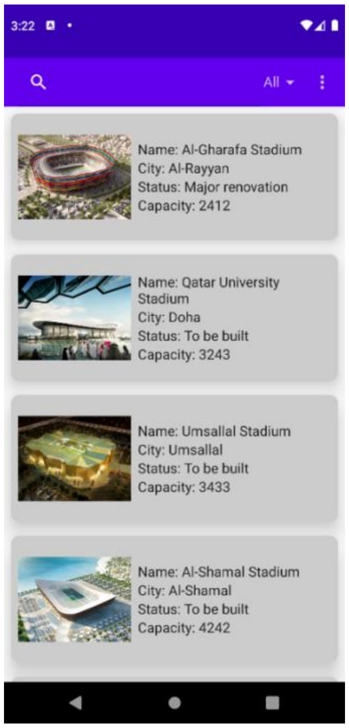
Name: Qatar University Stadium
City: Doha
Status: To be built
Capacity: 3243

Name: Umsallal Stadium
City: Umsallal
Status: To be built
Capacity: 3433

Name: Al-Shamal Stadium
City: Al-Shamal
Status: To be built
Capacity: 4242



Name: Al-Gharafa Stadium
City: Al-Rayyan
Status: Major renovation
Capacity: 2412

Name: Qatar University Stadium
City: Doha
Status: To be built
Capacity: 3243

Name: Umsallal Stadium
City: Umsallal
Status: To be built
Capacity: 3433

Name: Al-Shamal Stadium
City: Al-Shamal
Status: To be built
Capacity: 4242

Stadiums are sorted by seating capacity

Stadiums are sorted by name

Figure 3.Stadium sort options