# Mobile Applications
# CSCI 448
# Lecture 07

MVVM ←→ Three Tier Architecture

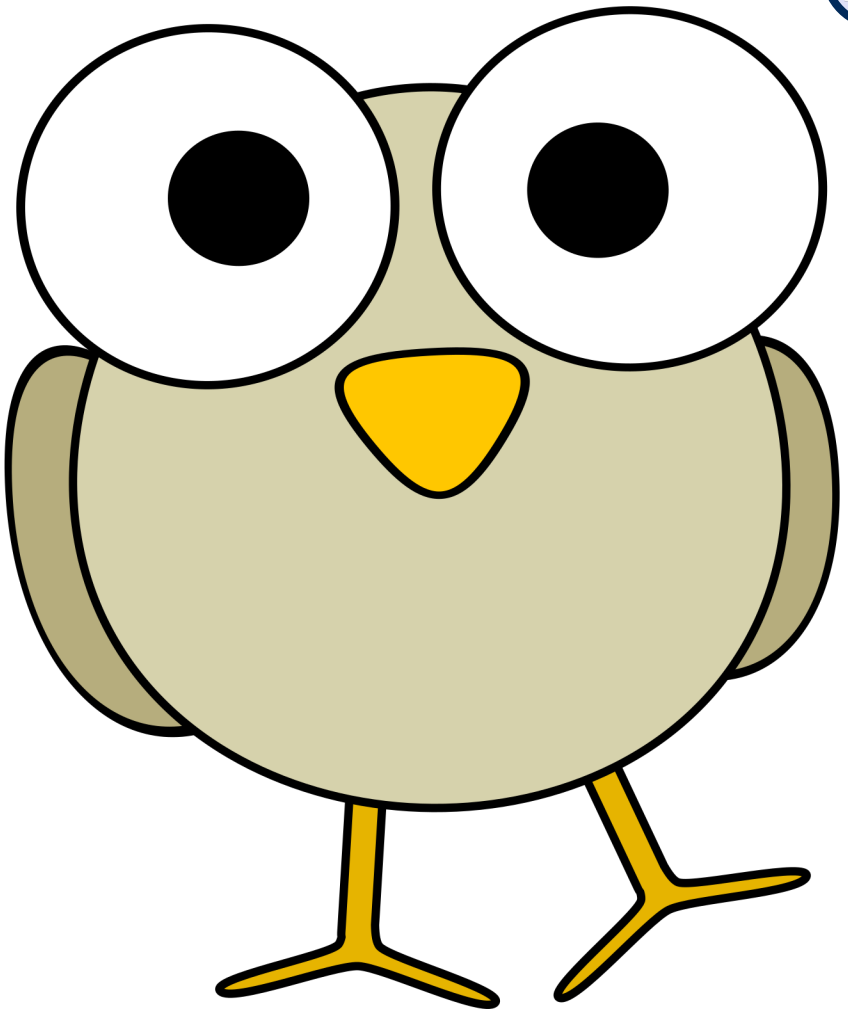
What Goes Where?

Storyboarding

# Previously in CSCI 448

- Stateless Composables
  - Hoist state to external manager
  - Flow events upwards
- View Model
  - Stores state and methods to modify state
  - Passes `value` and `onValueChange` function to Composable

# Questions?



# Learning Outcomes For Today

- Explain the roles of each component of the MVVM architecture.
- Explain the layers of a three-tier architecture.
- Explain how MVVM integrates into a three-tier architecture.

- Create an app following the three-tier architecture utilizing MVVM.

# On Tap For Today

- MVVM / Three-Tier Architecture
- Storyboarding

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# MVVM

1. Model stores data
2. View Model observes Model data
3. View Model prepares data as state for View
4. View observes View Model state
5. View informs View Model of events
6. View Model informs Model to persist state as data

# MVVM Logic

- View : UI Logic
- View Model : Presentation Logic
- Model : Data Logic

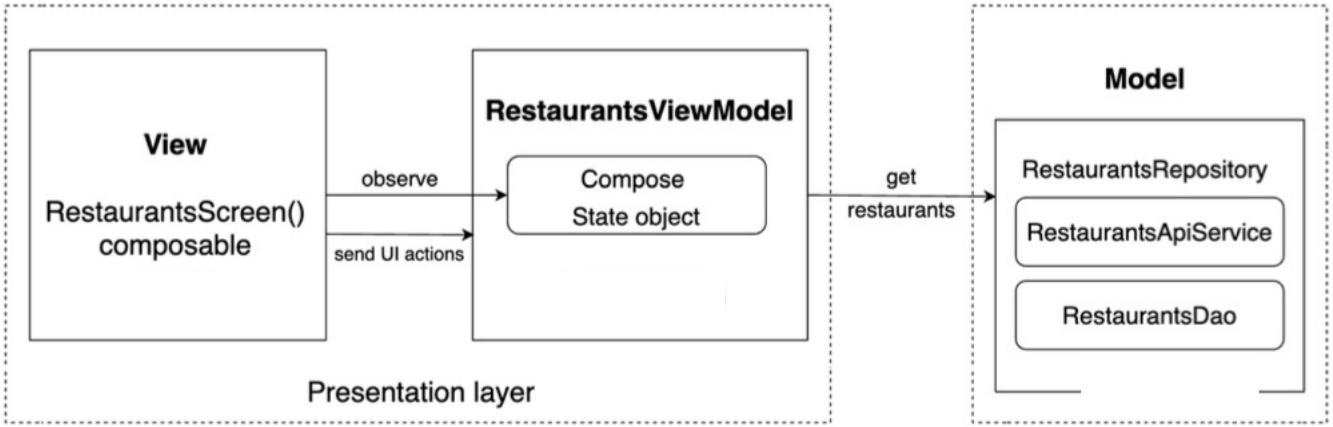


Figure 7.6 – Components with well-separated responsibilities per layer in the MVVM pattern

# Three Tier Architecture

- Presentation Layer
- Business / Domain Layer
- Model Layer

Figure 8.2 – Layering of responsibilities in the Restaurants app, including the Domain layer

# Domain Layer

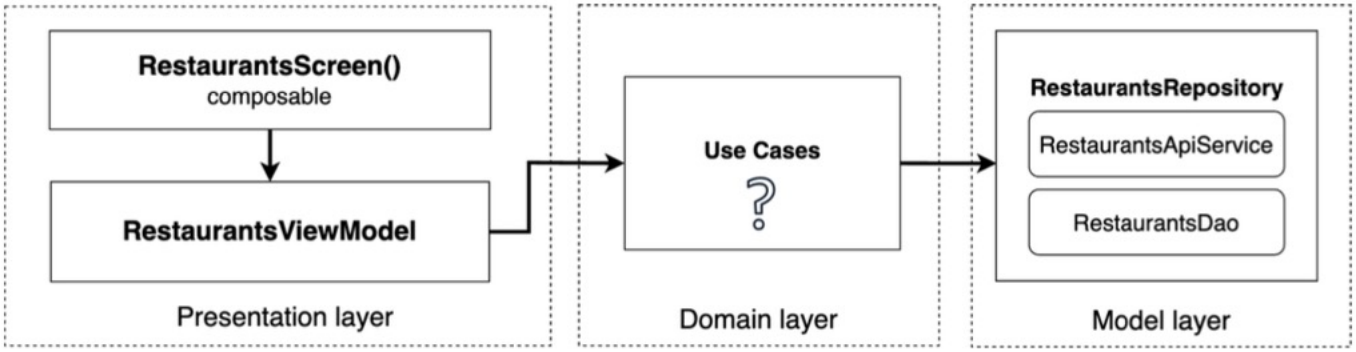


Figure 8.3 – Layering of responsibilities where the Domain layer contains Use Cases

# Design Principles

1. ***Favor composition over inheritance***:
   Compose UI, Classes
2. ***Write Once Read Many***: resources (strings)
3. ***Separation of Concerns***: MVVM

# On Tap For Today

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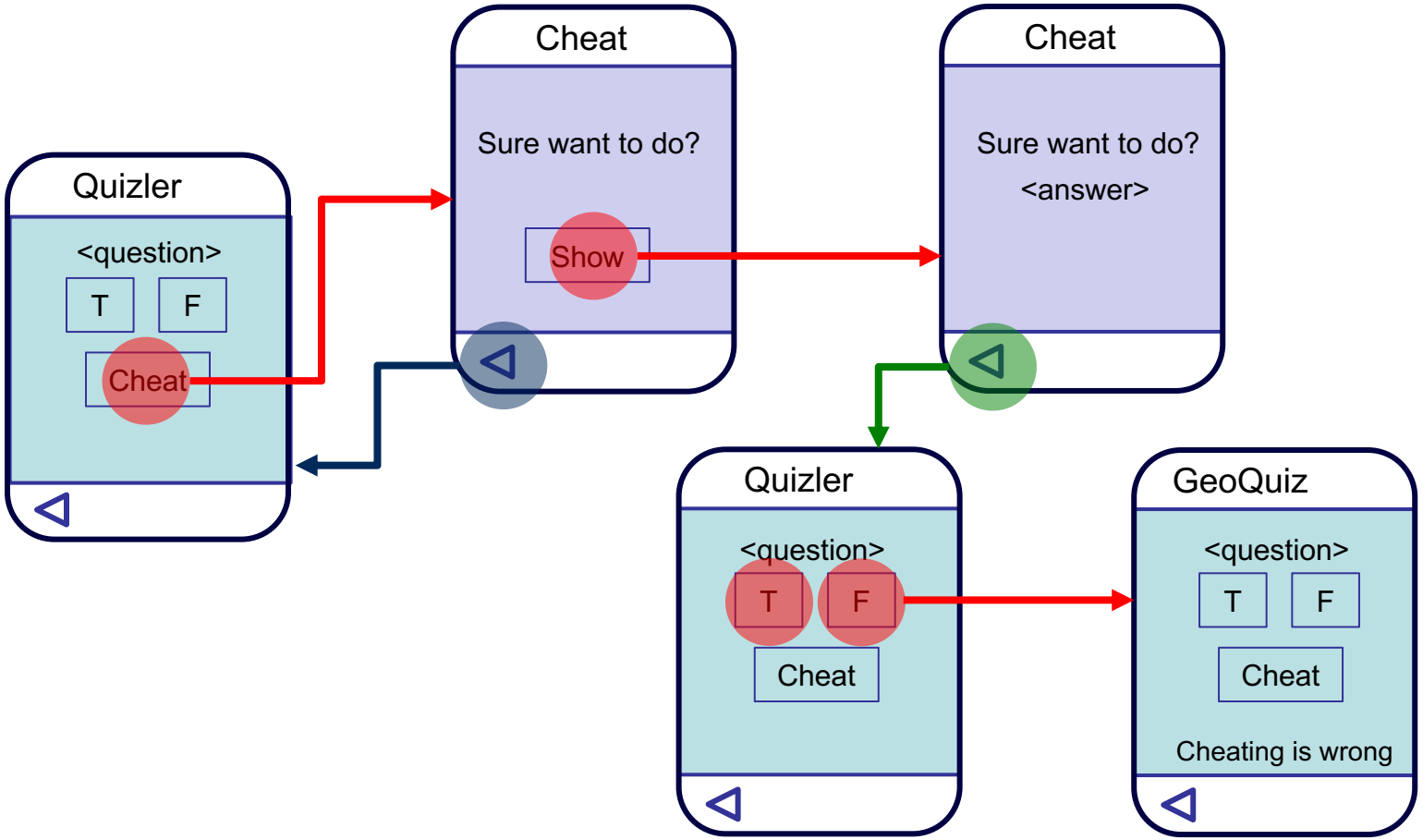
# Final Project Proposal (Model)

1. Company Name
2. Team Members
3. App Name
4. Expanded Description of App
5. Database Usage: Local/Cloud & ER Diagram
6. Technical Components
7. Distribution of Labor
8. Road Map
9. Deliverable Leads
10. Challenges
11. Sources

# Final Project Storyboards (View)

- Next deliverable
- App is being built up following MVVM

# Storyboard - Define Behavior



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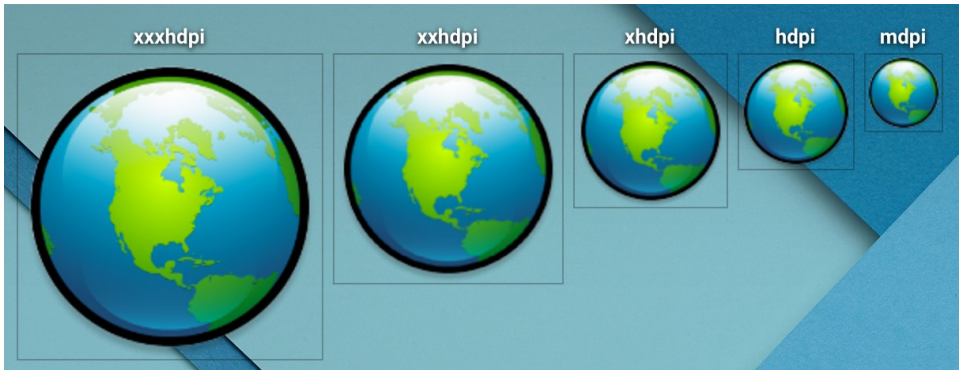
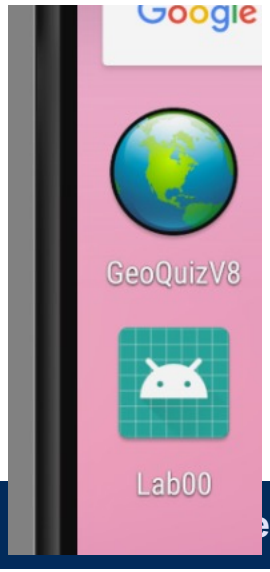
# Android Manifest (XML)

- Names package for app (unique id)
- Describes components of app
  - Activities, services, etc.
- Declares permissions
  - To use protected parts of Android API
  - That other apps need to access it
- App name & icon to display
- And more…

# Creating an App Icon

- Create icon at different densities
  - Store in drawable / mipmap folder
- Set in manifest file
  - `<activity android:icon="@drawable/…">`
- https://icon.kitchen/



# To Do For Next Time

- Kotlin Collections quiz due tonight
- Lab01 due tomorrow
- Lab02 due Friday
- Project Proposal due Friday

- Kotlin Strings quiz completed before Friday's class
  - Access code: `superhero`