1. Explain the Android app structure in detail, including the purpose of the AndroidManifest.xml file, Gradle, and various directories (e.g., res, src).

The Android app structure consists of several key components:

1. **AndroidManifest.xml**:

   - Defines app metadata, components (activities, services, etc.), permissions, and themes.

   - Acts as the entry point for the Android system to understand your app's configuration.

2. **Gradle**:

   - **Build System**: Automates building, testing, and packaging.

   - **build.gradle**: Two files (`Project` and `Module`) manage dependencies, SDK versions, and build settings.

3. **Directories**:

   - **src**: Contains Java/Kotlin code for app logic.
     - `main/java`: Source code for activities, fragments, and other classes.
     - `main/assets`: Raw files accessed via the `AssetManager`.
   - **res**: Stores resources like layouts, images, and strings.
     - `layout/`: XML files for UI design.
     - `drawable/`: Images and graphic assets.
     - `values/`: XML for strings, styles, and dimensions.
   - **lib/**: External libraries used by the app.
   - **test/ and androidTest/**: Code for unit and UI tests.