Understanding Android Activity Lifecycles

Objective

To explore and understand the Android Activity Lifecycle and its stages, focusing on how the system manages different states of an activity.

Activity Lifecycle Overview

The Android Activity Lifecycle consists of several states that an activity transitions through during its lifespan:

- **Created**
- **Started**
- **Resumed**
- **Paused**
- **Stopped**
- **Destroyed**

Lifecycle Methods

Key lifecycle callback methods include:

1. **onCreate()**: Called when the activity is first created. This is where you initialize the activity (e.g., set up the UI).
2. **onStart()**: Called when the activity becomes visible to the user.
3. **onResume()**: Called when the activity enters the foreground and is interactive.
4. **onPause()**: Called when the activity is partially obscured (e.g., when a dialog appears).
5. **onStop()**: Called when the activity is no longer visible.
6. **onRestart()**: Called when the activity is returning to the foreground from a stopped state.
7. **onDestroy()**: Called when the activity is destroyed and resources are cleaned up.

State Diagram

Include a diagram illustrating the transitions between states (similar to the one in the image).

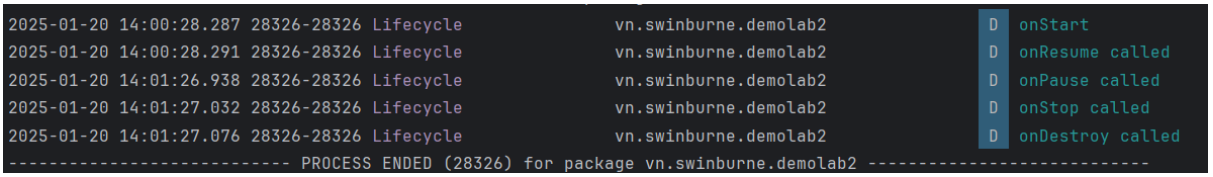
Provide a sample code snippet demonstrating how to log each lifecycle method:

```kotlin
override fun onStart() {
    super.onStart()
    Log.d( tag: "Checking",  msg: "onStart")
}

override fun onResume() {
    super.onResume()
    Log.d( tag: "Lifecycle",  msg: "onResume called")
}

override fun onPause() {
    super.onPause()
    Log.d( tag: "Lifecycle",  msg: "onPause called")
}

override fun onStop() {
    super.onStop()
    Log.d( tag: "Lifecycle",  msg: "onStop called")
}

override fun onDestroy() {
    super.onDestroy()
    Log.d( tag: "Lifecycle",  msg: "onDestroy called")
}
```

Experiment

Run an Android app and observe the lifecycle transitions by:

1. Opening the app.
2. Navigating away (e.g., pressing the Home button).
3. Returning to the app.
4. Closing the app.



This report summarizes the importance of understanding the Activity Lifecycle for effective app development, especially in handling user interactions and managing resources.