**ANDROID APP DEVELOPMENT 1 - ITE-5333-0NA**

LAB 10 - CASE STUDY

Name : LINGA SAI SRILAXMI

ID : N01653528

**Reflection Questions**

1. How can you ensure that a broadcast receiver does not introduce security vulnerabilities?

ANS :

* It uses explicit broadcasts when possible to limit who can receive them.
* Apply permissions in the manifest to restrict access.
* Use LocalBroadcastManager for in-app communication instead of system-wide broadcasts.

1. What are the best practices for optimizing a service to run efficiently in the background?

ANS :

* To Use foreground services for critical tasks.
* To Use WorkManager for scheduled tasks.
* To Minimize resource usage by using job scheduling and doze mode.

1. How can you implement a foreground service and when should you use it instead of a background service?

ANS :

* A foreground service is implemented using startForeground(), which requires a persistent notification.
* Use it for tasks that must run continuously, like music players, GPS tracking, or health monitoring apps.

1. How does using LiveData or WorkManager improve the efficiency of background tasks over using a simple Service?

ANS :

* LiveData automatically updates the UI when data changes, reducing manual handling.
* WorkManager ensures tasks run efficiently, even after app restarts, and follows system energy-saving policies.

1. What are the advantages and disadvantages of binding a service to an activity?

ANS :

Advantages :

* Allows direct communication between the activity and service.
* Efficient for short-term tasks.

Disadvantages:

* The service stops when the activity is destroyed (unless handled separately).
* Can cause memory leaks if not unbound properly.

1. How can implicit intents be filtered to prevent unintended apps from handling sensitive operations?

Ans :

* Use intent filters to specify only trusted apps.
* Validate the intent before processing the data.
* Use explicit intents when dealing with sensitive data.

1. How can you handle permission requests dynamically when using features like the camera or location services?1. How does an explicit intent differ from an implicit intent, and when should each be used?

Ans :

* Use requestPermissions() in runtime for dangerous permissions.
* Check if permission is granted before proceeding.
* Explain why permission is needed using a dialog or UI message before requesting it.
* Explicit Intent: Targets a specific component (e.g., launching an activity in the same app).
* Implicit Intent: Lets the system decide which app can handle the request (e.g., sharing an image).
* Use explicit when interacting within your app, and implicit when requesting an external app’s functionality.

1. Why is a BroadcastReceiver useful in an Android application?

Ans :

It allows apps to react to system-wide or custom events, such as network changes, SMS received, or battery status updates.

1. How does a background service impact battery life, and what are some best practices to optimize its performance?

Ans :

* Background services consume battery as they keep running.

Best practices:

* Use JobScheduler or WorkManager.
* Avoid unnecessary wake locks.
* Use foreground services only when needed.

1. What security concerns should be considered when using implicit intents?

Ans :

* Any app that matches the intent filter can handle the request, which may lead to data leaks or malicious activity.
* Use explicit intents for sensitive data, and grant permissions carefully using FLAG\_GRANT\_READ\_URI\_PERMISSION.

1. How can the Activity Result API improve handling results from external activities like the camera app?

Ans :

* It simplifies receiving results from activities (e.g., camera, file picker) without needing onActivityResult().
* Reduces boilerplate code and improves lifecycle management.

1. What are the advantages of using services for long-running tasks instead of running them in an activity?

Ans :

* Services keep running even if the activity is closed.
* Activities should not handle long tasks as they can be destroyed, leading to task loss or app crashes.

1. How can you ensure that an application correctly handles broadcasted messages without conflicts with other apps?

Ans :

* Use LocalBroadcastManager for in-app messages.
* Apply permissions to restrict broadcast receivers.
* Register and unregister receivers properly to avoid memory leaks.