VIVA QUESTIONS FOR PROGRAMS (1-12)

1. Create a Facebook Page Using RelativeLayout

Answers:

- **What is a RelativeLayout in Android?**
    - RelativeLayout is a type of layout in Android where the positions of child elements are defined relative to each other or their parent container.
- **How does RelativeLayout differ from LinearLayout and ConstraintLayout?**
    - LinearLayout arranges views in a single direction (either horizontally or vertically), whereas RelativeLayout positions views relative to each other or their parent. ConstraintLayout offers more flexibility with a flat view hierarchy and is more performance-optimized.
- **How do you position UI components relative to each other in RelativeLayout?**
    - You can use attributes like android:layout_below, android:layout_toRightOf, etc., to position components relative to other views in the layout.
- **What is the purpose of the android:layout_alignParentTop attribute in RelativeLayout?**
    - This attribute aligns the child view to the top of the parent view.
- **Can you use different layouts inside a RelativeLayout?**
    - Yes, you can nest layouts inside a RelativeLayout for complex UI structures.
- **How does the findViewById() method work in this context?**
    - findViewById() is used to reference UI elements defined in XML by their ID and manipulate them programmatically in the Activity or Fragment.
- **Explain the usage of the setOnClickListener() method.**
    - setOnClickListener() is used to handle user interaction with a button or any clickable view. It listens for a click event and defines actions that should happen when clicked.
- **What are the common issues you might face when working with RelativeLayout?**
    - Misalignments of views, performance issues due to a deeply nested view hierarchy, and difficulty managing complex UIs can be common issues.

---

2. Develop an Application That Toggles Image Using FrameLayout

Answers:

- **What is FrameLayout, and how does it differ from other layouts like LinearLayout and RelativeLayout?**
    - FrameLayout is a simple layout that stacks child views on top of each other. It is useful when you need to overlay views, like toggling images.
- **How does FrameLayout manage its child views?**
    - FrameLayout places all its child views in the same space, with the last added view on top.
- **How do you toggle images using ImageView in Android?**
    - You can use setImageResource() to change the image displayed by an ImageView.
- **What are the key functions used to change the image in an ImageView?**
    - setImageResource(), setImageURI(), setImageBitmap() are some functions used to change images in ImageView.
- **What is the purpose of a boolean flag in this program?**
    - The boolean flag is used to track whether the image is toggled or not, switching the image based on the flag's value.
- **Can you use FrameLayout to display multiple views at the same time?**
    - No, FrameLayout can only display one view at a time; newer views will stack on top of previous ones.
- **What happens when you call setImageResource()?**
    - setImageResource() changes the image resource of the ImageView to the provided image resource.
- **What type of images can be used in an ImageView?**
    - Images in an ImageView can be in the form of resources (drawable), URIs, or Bitmaps.

---

3. Implement Adapters and Perform Exception Handling

Answers:

- **What is an Adapter in Android?**
    - An Adapter in Android is a bridge between UI components like ListView or GridView and the underlying data source. It converts data into a view that can be displayed by these components.
- **Why do we need an adapter for ListView or GridView?**

    - Adapters are necessary to convert data from a data source (e.g., arrays, databases) into a format that can be displayed in a ListView or GridView.

- **Explain how an ArrayAdapter works.**
    - ArrayAdapter is a built-in adapter that binds an array or a list to a UI component like ListView. It takes data and converts it into views.
- **What is the difference between an ArrayAdapter and a Custom Adapter?**
    - ArrayAdapter is used for simple data structures like arrays, whereas a Custom Adapter is used when you need more control over the layout and data representation in a list item.
- **What is exception handling in Android, and how is it implemented using try-catch blocks?**
    - Exception handling in Android allows you to handle errors gracefully. try-catch blocks are used to catch exceptions and prevent the app from crashing.
- **Can you give an example where exception handling is necessary?**
    - Exception handling is necessary when interacting with resources like files, databases, or network calls, where errors like IOException or SQLException may occur.
- **What happens if an exception is not handled?**
    - If an exception is not handled, it will cause the app to crash or become unstable.
- **How does setOnItemClickListener() work in ListView or GridView?**
    - It listens for click events on list items and allows you to define actions to take when an item is clicked.

---

4. Implement Intent to Navigate Between Multiple Activities

Answers:

- **What is an Intent in Android?**
    - An Intent is an object used to perform an action, such as navigating between activities, starting a service, or broadcasting a message.
- **How do Intents help in navigating between activities?**
    - Intents allow you to launch new activities or components in Android. You use startActivity() to navigate between activities.
- **What are the two types of Intents?**

- Explicit Intents (target a specific activity) and Implicit Intents (used when the target activity is unspecified and Android decides which app to use).

- **How do you pass data between activities using Intents?**
  - You use putExtra() to add data to an Intent and getIntent().getExtras() to retrieve it in the receiving activity.
- **Explain the difference between explicit and implicit Intents.**
  - Explicit Intents specify the target component (activity, service), while implicit Intents do not specify the component and let the system find the best match.
- **What is the use of the startActivity() method?**
  - startActivity() is used to start a new activity.
- **Can an Intent be used to open a website or send a message?**
  - Yes, Implicit Intents can open a website (using Intent.ACTION_VIEW) or send a message (using Intent.ACTION_SEND).
- **How does the Android Activity lifecycle work when switching between activities?**
  - When switching activities, the current activity goes through lifecycle states (onPause(), onStop(), onDestroy()), and the new activity goes through onCreate(), onStart(), and onResume().

---

5. Develop an Application That Uses ArrayAdapter with ListView

Answers:

- **What is a ListView, and how is it different from other list components like RecyclerView?**
  - ListView is used to display a vertical list of items. Unlike RecyclerView, which is more flexible and efficient, ListView has less control over its item views and is less performance-optimized.
- **What is an ArrayAdapter and how does it work with ListView?**
  - ArrayAdapter takes an array of data and creates a view for each item in the ListView.
- **How do you customize the items in a ListView?**
  - You can create a custom layout for each item and pass it to the ArrayAdapter or create a custom adapter.
- **What is the purpose of setAdapter() in ListView?**

    - setAdapter() binds the data source (like an ArrayAdapter) to the ListView so that the list items are displayed.

- **How does setOnItemClickListener() function in a ListView?**
    - setOnItemClickListener() listens for click events on the list items and triggers an action when an item is clicked.
- **What other types of adapters can be used with ListView?**
    - CursorAdapter, BaseAdapter, SimpleAdapter, and custom adapters can be used.
- **What is the advantage of using ArrayAdapter over manually creating an adapter?**
    - ArrayAdapter simplifies binding simple data like strings to a ListView, saving time and effort.
- **How do you handle large datasets efficiently in ListView?**
    - You can use RecyclerView or optimize ListView with ViewHolders and paging to handle large datasets efficiently.

---

6. Develop an Application That Implements Spinner Component and Performs Event Handling

Answers:

- **What is a Spinner in Android?**
    - A Spinner is a drop-down list UI component that allows users to select one item from a list.
- **How is a Spinner different from a ListView?**
    - A Spinner is a single item selection control, while a ListView allows the selection of multiple items or displays a larger dataset.
- **How do you populate data in a Spinner using an ArrayAdapter?**
    - You pass an ArrayAdapter (with data) to the spinner using setAdapter().
- **Explain how setOnItemSelectedListener() works with a Spinner.**
    - setOnItemSelectedListener() listens for user selections and triggers actions based on which item is selected.
- **What are the common uses of a Spinner in Android apps?**
    - Used for choosing options, like selecting a country, date, or sorting options.
- **How does the dropdown in Spinner appear, and how can it be customized?**

    - The dropdown shows a list of items and can be customized using a custom adapter and layout.

- **How do you handle user selection in a Spinner?**
    - You retrieve the selected item using the listener's onItemSelected() method.
- **What would happen if no item is selected in a Spinner?**
    - If no item is selected, the default selection (often the first item) is used.

---

7. Create Database Using SQLite and Perform INSERT and SELECT

Answers:

- **What is SQLite, and why is it used in Android?**
    - SQLite is a lightweight, embedded database engine used in Android for storing structured data.
- **How do you create a database in SQLite for an Android app?**
    - You use SQLiteOpenHelper to manage the database creation and versioning.
- **What is the purpose of SQLiteOpenHelper?**
    - SQLiteOpenHelper helps create and manage the database schema and provides methods for upgrading and downgrading the database.
- **Explain the structure of the onCreate() and onUpgrade() methods.**
    - onCreate() creates the database schema, while onUpgrade() handles database version upgrades.
- **What is the role of ContentValues in database operations?**
    - ContentValues is used to store a set of key-value pairs to insert into or update a database.
- **How do you insert data into SQLite using insert()?**
    - Use SQLiteDatabase.insert() with a table name and ContentValues containing data.
- **How do you retrieve data from the database using a Cursor?**
    - Use SQLiteDatabase.query() or rawQuery() to execute SQL queries, and a Cursor is returned to access the result set.
- **What is the difference between rawQuery() and query()?**

    - rawQuery() allows direct SQL query execution, while query() provides a more structured way to perform queries with additional features like filtering and ordering.

- **How would you update or delete records in SQLite?**
    - Use update() or delete() methods of SQLiteDatabase to modify or remove records.

8. Create a Facebook Page Using RelativeLayout; Set Properties Using XML File

Answers:

- **What is a RelativeLayout in Android?**
    - As explained in program 1, RelativeLayout is a layout where child views are positioned relative to each other or the parent view.
- **How does RelativeLayout differ from LinearLayout and ConstraintLayout?**
    - Same as program 1. RelativeLayout positions elements relative to each other, whereas LinearLayout arranges elements in one direction, and ConstraintLayout offers more flexible and performance-efficient layouts.
- **Can you use different layouts inside a RelativeLayout?**
    - Yes, you can nest other layouts like LinearLayout or FrameLayout inside RelativeLayout.
- **What is the advantage of using XML to set properties?**
    - XML allows for easy separation of UI layout and code, making it cleaner and more maintainable.
- **How does android:layout_alignParentTop work in RelativeLayout?**
    - This property aligns a child view to the top of its parent container.

---

9. Develop an Application That Toggles Image Using FrameLayout

Answers:

- **What is FrameLayout in Android?**
    - A FrameLayout is used to display a single view at a time. If multiple views are added, they stack on top of each other.
- **How do you toggle images using an ImageView in FrameLayout?**
    - You can toggle between images using setImageResource() or setImageURI() on the ImageView.

- **What are the benefits of using FrameLayout?**
    - It is lightweight and perfect for scenarios where you want to overlay views, like toggling between images.
- **What is a boolean flag used for in this context?**
    - The boolean flag is used to track whether the image has been toggled or not, switching the displayed image accordingly.

---

10. Implement Adapters and Perform Exception Handling

Answers:

- **What is an Adapter in Android?**
    - An Adapter is used to bind data from a data source (e.g., arrays, databases) to a view component like ListView or GridView.
- **What types of Adapters are used in Android?**
    - Common adapters include ArrayAdapter, BaseAdapter, SimpleAdapter, and custom adapters.
- **What is exception handling in Android?**
    - Exception handling involves using try-catch blocks to handle errors during runtime, preventing crashes and enabling graceful error handling.
- **How does setOnItemClickListener() work?**
    - setOnItemClickListener() listens for click events on items in ListView or GridView and performs actions when an item is clicked.

---

11. Implement Intent to Navigate Between Multiple Activities

Answers:

- **What is an Intent in Android?**
    - An Intent is an object used to request an action, such as launching an activity, service, or broadcasting a message.
- **How does an Intent help navigate between activities?**
    - You can use an Intent to start a new activity by calling startActivity(intent), which allows you to move between different screens.
- **How do you pass data between activities?**

- Data can be passed using putExtra() to add information to the Intent and accessed in the second activity using getIntent().getExtras().

- **What are the different types of Intents?**
  - Explicit Intents specify the target activity, while Implicit Intents allow the system to choose the appropriate activity based on the action type.

---

12. Develop an Application That Uses ArrayAdapter with ListView

Answers:

- **What is a ListView in Android?**
  - ListView is a view that displays a list of items. It can handle large data sets and is commonly used to display data from an array or a database.
- **How does an ArrayAdapter work with ListView?**
  - ArrayAdapter is a pre-built adapter that binds an array or a list to a ListView, automatically displaying each item in the list.
- **What is the purpose of setAdapter() in ListView?**
  - setAdapter() connects the ArrayAdapter (or any other adapter) to the ListView, allowing it to display the data in the list.
- **What is setOnItemClickListener() used for?**
  - It listens for click events on individual items in the ListView and triggers a specific action when an item is clicked.
- **How can you customize the layout of ListView items?**
  - You can use a custom adapter and create a custom XML layout for each list item to display complex data.

GENERAL VIVA QUESTIONS

Answers:

- **Explain the Android Activity Lifecycle.**
    - The Android Activity lifecycle consists of several stages, including onCreate(), onStart(), onResume(), onPause(), onStop(), and onDestroy(), which manage the state and behavior of an activity as it is created, used, paused, or destroyed.
- **What is the difference between onCreate() and onStart()?**
    - onCreate() is called when an activity is created, while onStart() is called when the activity is becoming visible to the user.
- **How do you handle runtime permissions in Android?**
    - You use ActivityCompat.requestPermissions() to request permissions and onRequestPermissionsResult() to handle the response.
- **What is the purpose of an Android manifest file?**
    - The Android manifest file defines the application's structure, permissions, components, and metadata.
- **What is the difference between dp, sp, and px in Android?**
    - dp (density-independent pixels) is used for layout size, sp (scale-independent pixels) is for text size, and px is used for actual pixels on the screen.
- **Explain the usage of background tasks and services in Android.**
    - Services are used to perform long-running operations in the background without affecting the UI, while background tasks can be handled by AsyncTask, IntentService, or JobScheduler.
- **What are the different types of storage in Android (Internal, External, SQLite)?**
    - Internal storage stores private data within the app's sandbox; external storage allows sharing data across apps; SQLite is for structured data storage.
- **How does Android handle concurrency?**
    - Android handles concurrency using threads, AsyncTask, and background services to perform operations without blocking the UI thread.
- **What is the role of RecyclerView in Android development?**
    - RecyclerView is an advanced version of ListView, optimized for performance, supporting different layouts and animations.

- **What is the Activity lifecycle in Android?**
    - The Activity lifecycle includes methods like onCreate(), onStart(), onResume(), onPause(), onStop(), and onDestroy() that control the state of an activity as the user interacts with it.
- **What is the difference between dp, sp, and px?**
    - dp (density-independent pixels) is used for general layout sizes, sp (scale-independent pixels) is used for text sizes, and px (pixels) represents actual screen pixels.
- **How do you handle permissions in Android?**
    - Permissions can be requested using ActivityCompat.requestPermissions() for runtime permissions and onRequestPermissionsResult() for handling the user's response.
- **What is SQLite used for in Android?**
    - SQLite is an embedded database used to store structured data in Android. It allows efficient querying and manipulation of data within the app.
- **What is the role of RecyclerView in Android?**
    - RecyclerView is a flexible and performance-optimized widget for displaying large sets of data in a list or grid format. It supports animations and multiple layout types.
- **How do you handle background tasks in Android?**
    - Background tasks can be handled using AsyncTask, IntentService, JobScheduler, or WorkManager to perform long-running operations without blocking the main UI thread.
- **What is the purpose of the Android Manifest file?**
    - The AndroidManifest.xml file declares the app's components (like activities, services, and broadcast receivers), permissions, and configurations.