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What are callback methods? Explain with Google Maps example.

→ In the Google Maps API, callbacks are used to notify the implementer when certain events occur, and then execute methods.

A callback method is a method that will be called when some event occurs. Normally you can implement this by passing an implementation of a certain interface to the API, which is responsible for triggering the event.

Common events in Google Map:

1. onmapLoaded(callback) — onMapReady(OnMapReadyCallback)
2. locationChanged — onLocationChanged(Location)
3. onmapClick(LatLngLiteral) — onMapClick(LatLng) → onLongClick(LatLng)
4. onmapRightClick(LatLngLiteral) — onMapRightClick(LatLng) → onLongClick(LatLng)

OnMapReadyCallback example:

This is the callback interface for when the Google Map is ready to be used. We need to implement it and override the onMapReady() method. Once the instance of this interface is set on the MapView/MapFragment, a new call is made to the GoogleMap to handle any customizations, instead of setting up.

```
public class OnMapReadyCallbackExample
    implements OnMapReadyCallback {
    private GoogleMap gmap;
    @Override
    public void onMapReady(GoogleMap gm) {
        this.gmap = gm;
    }
}
```

What is a GoogleMap? What are various types of Google Map? Detailed discussion on the different Google MAP on your application. You can drawing location on the map on your own custom different icons, landmarks, etc. You can even customize maps according to your needs.

GoogleMap class → GoogleMap class is an main mapping service. Introduced by google, and it offers almost everything that you would expect from a map. It is the central point from Android's mapping to basic planning and add some traffic conditions. And so, about value factor.

Types of Google Maps in Android: (GoogleMap.gm)

Android provides six styles of maps, all types of Google Maps provided by MAP_TYPE_NORMAL API along with an optional None type.

1. Normal Map — Normal maps are the regular road maps. (MAP_TYPE_NORMAL)
2. Satellite Map — satellite maps are satellite view of google. (MAP_TYPE_SATELLITE)
3. Terrain — gm.setMapType(GoogleMap.MAP_TYPE_NORMAL);
4. Hybrid Map — Hybrid maps are satellite photographs with street, railroads, and other features. (GoogleMap.MAP_TYPE_HYBRID)
5. Hybrid Maps — Hybrid maps contain street patterns, of satellite, terrain and national maps. gm.setMapType(GoogleMap.MAP_TYPE_HYBRID)
6. None — Empty grid with no map tiles.
   gm.setMapType(GoogleMap.MAP_TYPE_NONE);

Q.10 — How do use Bluetooth in Android Studio? Explain Bluetooth is a way to exchange data with other devices. Develop an Android project. Bluetooth API is provided several tasks such as:

1. scan bluetooth devices.
2. connect and through data from and to other devices.
3. manage multiple connections.

Android Bluetooth API:

The android bluetooth package provides a lot of integrated classes to work with bluetooth such as:

1. BluetoothAdapter → represents the local bluetooth device.
2. BluetoothDevice → represents remote bluetooth devices.
3. BluetoothSocket → client side socket to connect (connect).
4. BluetoothServerSocket → server side socket to read (accept).

BluetoothAdapter class (BluetoothAdapter.idea)

Using this class we can perform local bluetooth tasks such as enable/disable, discovery, query a list of paired (bonded) devices, create a BluetoothServerSocket instance to listen for connection requests, etc.

Constants: (BluetoothAdapter.class)

1. String ACTION_REQUEST_ENABLE
2. String ACTION_REQUEST_DISCOVERABLE
3. String ACTION_DISCOVERY_STARTED
4. String ACTION_DISCOVERY_FINISHED

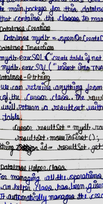
Methods: (of BluetoothAdapter.class)

1. Set getBondedDevices();
2. boolean isEnabled(); // (Is bluetooth enabled?)
3. boolean isDiscoverable(); // (Is bluetooth discoverable?)
4. String getName(); // (Get bluetooth name)
5. int getScanMode(); // (Get bluetooth discoverability)
6. int getState();

Q.11 How do content providers work? Explain

→ In Android, content providers are very important component that serve the purpose of sharing Android database to other the data of your application.

The role of content provider in the Android system is like a central repository in which data of applications is stored, and it performs CRUD operations. Content provider manipulates data based on the user requests. Android content provider allows the content providers to access data stored in other content providers.



Q.12 How can create file system in Android Studio? Explain

→ Android provides a file system, and very important component that serves the purpose of individual database to store the data of your application.

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1. Application Context — Context is a global context in your application. It lives as long as your application lives.
2. Activity Context — Activity Context is tied to the lifecycle of an activity. It may be destroyed when the activity is finished.
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