5COSC023W - MOBILE APPLICATION DEVELOPMENT
Lecture 9: Maps, Location and Runtime Permissions

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Get the Last Known Location

Steps (set up):

1. Obtain an Google Maps API (for usage with Maps) and insert it in the `res/values/` (follow the instructions in the same file for how to obtain the API key).

2. Add a **dependency** of Google Play location services by adding the following line in the `build.gradle` module file (where `XX.X.X` is the latest version for Google Play Services:

   ```
   implementation 'com.google.android.gms:play-services-location:XX.X.X'
   ```

3. Add the `ACCESS_FINE_LOCATION` permission in the manifest file of the project:

   ```
   <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>
   ```

Get the Last Known Location (cont'ed)

Steps (Kotlin code):

1. Check if the permission is granted by the user, otherwise request the permission by calling ActivityCompat.requestPermissions.

2. Implement in your activity the onRequestPemissionsResult() callback method which will receive the permissions result.

3. Create a FusedLocationProviderClient object:
```
mFusedLocationClient =
      LocationServices.getFusedLocationProviderClient(this);
```

4. Call getLastLocation() (or access the lastLocation property) on the FusedLocationProviderClient object returning a Task object.

5. Call addOnSuccessListener() method on the task and pass it an object which implements the OnSuccessListener<Location> interface.

How to Receive Location Updates

Steps (Kotlin code):

1. Create a `LocationRequest` object containing the requirements of the request (update frequency, accuracy).

2. Create a `LocationCallback` as part of the activity and override its `onLocationResult()` method which is called periodically with the location updates.

3. Call `requestLocationUpdates()` on the `FusedLocationProviderClient` object and pass it the `LocationRequest` and the `LocationCallBack` objects.

Applications Developed in this Module

1. Lottery app.
2. Lost Dogs - Notify owners by email for their lost dog based on recognising the dog image.
3. Identify the dog breed based on random dog images.
4. The Memory game - Highlighting squares in a grid for a few seconds and challenge the user to recall the hidden squares.
5. The Tic Tac Toe Game (the Computer player attacks and defends in a logical manner)
6. Employee management system in a database.
7. The Book Finder app (retrieve details of a book from Internet)
8. The Weather App
9. Shopping management (add products and calculate their total cost by adding them to a database
10. Display the current (last) location of a user in a map.
11. Coctails app (display recipe and picture of a cocktail by searching in Internet).

Coursework apps:

1. Arithmetic game (be as fast as you can)
2. Movie retrieval and search from Internet.