Audio

Playback Speed Control

In adding playback speed or volume control to the application, an object from AVAudioPlayer has to be implemented that is responsible to play audio data from a given file. It can also control the volume, panning and rate of the sound.

```swift

player.volume=0.4f //Changes the volume of the audio
player.enableRate = true
player.prepareToPlay()
player.rate = 2.0  //Changes the playback rate
player.play()

```

HTTP/JSON

As it is popular to use 3rd party libraries such as Alamofire for HTTP Connection, in conducting Http networking, using URLSession class is just as sufficient.

In setting up the HTTP request using URLSession:

```swift

let dataURL = URL(string: "http://someurl.com")!

```

Using JSONDecoder, it decodes instances of a data type from JSON Objects

```swift

let JSONData = try JSONDecoder().decode(JSONTest.self, from: data)

```

Biometric Authentication

How does the IOS Biometric Authentication compare to Android's

Android makes use of the BiometricPrompt API feature which supports fingerprint authentication for Android 6.0 and higher. BiometricPrompt uses a CryptoObject from the CryptoManager class in order to

communicate with the system that encrypts, decrypts and stores the user's token in appeasing the need for security.

On the other hand, IOS implements their LocalAuthentication class that houses both TouchID and FaceID. For IOS phones greater than the IPhone X, they only cater for FaceID, while those below uses TouchID.

Background Tasks

How background tasks work in Android vs. IOS

An app is said to be performing tasks in the background when none of the app's activities are visible to the user and the app isn't running any foreground services that started while an activity from the app was visible.

Using the BackgroundTasks framework in IOS, the system launches the app in the background in order to run given tasks. IOS has the ability to study the user's behavior which schedules background tasks before routine usage.

Where as in Android, by implementing classes such as Thread, Handler, Intent Service and AsyncTask, background tasks, such as HTTP calls, can be run.

Notification

How notification tasks work in Android vs. IOS

Notifications serve the purpose of pushing messages from an app even if the app isn't running or the phone is sleeping. In applying notifications to an IOS app, Apple Push Notification (APN) must first be configured in the application. The app should then ask the user for to grant permission to display notifications. The content of the notification is created using UNMutableNotificationContent, after which setting the trigger which will set the time interval at which the notification is pushed to the user.

In comparison to IOS, Android's NotificationCompat API facilitates the creation of a notification

```java
NotificationCompat.Builder builder = new NotificationCompat.Builder(this,
CHANNEL_ID)
        .setSmallIcon(R.drawable.notification_icon)
        .setContentTitle(textTitle)
        .setContentText(textContent)
        .setPriority(NotificationCompat.PRIORITY_DEFAULT);


```

After which an instance of NotificationChannel is used to register the notification's channel and setting the importance.

Firebase Cloud Messaging

FCM offers a number of messaging options and capabilities, one such type of message which is able to be sent is Notification messages, which are handled automatically by the FCM SDK. It displays the message to the end-user on behalf of the client app.

In using FCM on IOS, after downloading the prerequisites for app development, an Apple Push Notification Authentication Key must be obtained and push notifications must be enabled in XCode.

Unified Push Alliance

In an effort to harmonize Android's push notifications and services in China, China's Ministry of Industry and Information Technology , in collaboration with many tech companies such as Huawei, Samsung, etc., founded the Unified Push Alliance. As Chinese developers are forced to used 3rd party push services, push messages run in the background and slow the operating speed and reduce the battery life of many of the Android devices. In order to unify Android push notifications sent through a number of apps on the Chinese market, the alliance was formed to address this issue. This move lead to Android devices receiving push notifications without affecting apps, thus conserving memory, battery life and data.

Apple Push Notification

Apple Push Notification service (APNs) is push notification service, created by Apple that enables developers to send notification data to applications installed on Apple devices. In order for the service to send notifications the service must know the address of the user's device. The app communicates with APNs and receives its device token which is then forwarded to the provider server. It is important to note that Push Notifications in XCode must be enabled. The app should be registered with an APN and receive a globally unique device token. The device token is essentially the address of the current device. The provider server must have this token in order to deliver notifications to the device.

Maps Service work in IOS

In IOS, the MapKit displays map and satellite imagery within an app window or views in the app. It also call out points of interest and determine placemark information based on map coordinates. It also has the ability to make directions available to Maps. Along with the framework provided by Apple, Google also provides a Maps SDK for IOS, where maps based on Google Maps can be added to an IOS application. This SDK handles access to the Google Maps server, map display and response to user gestures such as clicks and drags.