**Basics:**

**Data Members:**

**Primitives:**

(Access modifier) (var/val) (variable name): (variable type)

private var m\_number: Int

**Non-primitives:**

private lateinit var m\_card: Card

**Notes:**

lateinit will only work, but must be included, in the declaration of non-primitive data members.

val can only be assigned once and acts like a constant, whereas var acts like a traditional variable.

The first letter of the type must be capitalized.

**Resources:**

<https://kotlinlang.org/docs/reference/properties.html>

<https://kotlinlang.org/docs/reference/delegated-properties.html>

<https://www.bignerdranch.com/blog/kotlin-when-to-use-lazy-or-lateinit/>

**Variables:**

**Declaration without initialization:**

var/val m\_something: Something

**Declaration with initialization:**

var/val m\_something: somethingElse

**Resources:**

<https://kotlinlang.org/docs/tutorials/kotlin-for-py/declaring-variables.html>

**Functions:**

public fun functionName(parameters) {

function body

}

**Notes:**

Because functions are fun!

Always pass by value, but a passed value is a reference in java.

**Resources:**

[**https://kotlinlang.org/docs/reference/functions.html**](https://kotlinlang.org/docs/reference/functions.html)

<https://kotlinlang.org/docs/reference/basic-syntax.html>

**Sign In:**

**Google:**

**Packages:**

import com.google.android.gms.auth.api.signin.GoogleSignIn  
import com.google.android.gms.auth.api.signin.GoogleSignInAccount  
import com.google.android.gms.auth.api.signin.GoogleSignInClient  
import com.google.android.gms.auth.api.signin.GoogleSignInOptions  
import com.google.android.gms.common.SignInButton  
import com.google.android.gms.common.api.ApiException  
import com.google.android.gms.tasks.Task

**Dependencies:**

Locate the build.gradle (Module: app) file:

implementation 'com.google.firebase:firebase-auth:16.0.5'  
implementation "com.google.firebase:firebase-auth:19.1.0"  
implementation "com.google.android.gms:play-services-auth:17.0.0"

**.xml**

<com.google.android.gms.common.SignInButton  
 android:id="@+id/sign\_in\_button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content" />  
<Button  
 android:id="@+id/sign\_out\_button"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:paddingTop="20dp" />

**Variables:**

val signInButton:

val signOutButton:

val googleSignInOptions:

val googleSignInClient:

val googleSignInAccount:

**Code:**

val signInButton = findViewById<SignInButton>(R.id.*sign\_in\_button*)

This assigns the signInButton variable to the GUI Google Sign In button.

Note:

signInButton.setSize(SignInButton.*SIZE\_STANDARD*)

This implements a default size for the button.

val signOutButton = findViewById<Button>(R.id.*sign\_out\_button*)

This assigns the signOutButton variable to the GUI sign out button.

val googleSignInOptions = GoogleSignInOptions.Builder(GoogleSignInOptions.*DEFAULT\_SIGN\_IN*)  
 .requestIdToken(getString(R.string.*default\_web\_client\_id*))  
 .requestEmail()  
 .build()

This code establishes the options for when the button is clicked.

Note:

More info -> <https://developers.google.com/android/reference/com/google/android/gms/auth/api/signin/GoogleSignInOptions.Builder>

val googleSignInClient = GoogleSignIn.getClient(this, googleSignInOptions)  
val googleSignInAccount: GoogleSignInAccount

This code initializes an instance of the GoogleSignInClient, with the GoogleSignInOptions instance. Then declares an unassigned GoogleSignInAccount object for later use.

Note:

More info ->

<https://developers.google.com/android/reference/com/google/android/gms/auth/api/signin/GoogleSignInClient>

<https://developers.google.com/android/reference/com/google/android/gms/auth/api/signin/GoogleSignInAccount.html>

signInButton.setOnClickListener **{** onSignIn(googleSignInClient)  
**}**

When the sign in button is clicked, call the user-created onSignIn function and send it the GoogleSignInClient instance.

public fun onSignIn(m\_GoogleSignInClient: GoogleSignInClient) {  
 startActivity(m\_GoogleSignInClient.*signInIntent*)  
 val task = GoogleSignIn.getSignedInAccountFromIntent(m\_GoogleSignInClient.*signInIntent*)  
 val acct = GoogleSignIn.getLastSignedInAccount(this)  
 if(acct != null) {  
 val displayName = acct.*displayName* val givenName = acct.*givenName* val familyName = acct.*familyName* val email = acct.*email* val id = acct.*id* displayMessage(displayName.*toString*())  
 displayMessage(givenName.*toString*())  
 displayMessage(familyName.*toString*())  
 displayMessage(email.*toString*())  
 displayMessage(id.*toString*())  
 }  
}