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Firebase Authentication with Phone Number OTP in Android

Difficulty Level : Basic • Last Updated : 13 May, 2022

Many apps require their users to be authenticated. So for the purpose of authenticating the apps uses phone number authentication inside their apps. In phone authentication, the user has to verify his identity with his phone number. Inside the app user has to enter his phone number after that he will receive a verification code on his mobile number. He has to enter that verification code and verify his identity. So this is how phone authentication works. [Firebase](#) provides so many ways for authentication users such as Google, Email and Password, Phone, and many more. In this article, we will take a look at the implementation of Phone Authentication inside our App using Firebase.

What we are going to build in this article?

We will be creating a simple application which is having two screens. The first screen will be our Verification screen on which the user has to add his phone number. After adding his phone number, the user will click on the Get OTP button after that Firebase will send OTP on that number which is mentioned above. After receiving that OTP user has to enter that OTP in the below text filed and click on the below button to verify with entered OTP. After clicking on the verify button Firebase will verify that OTP and allow

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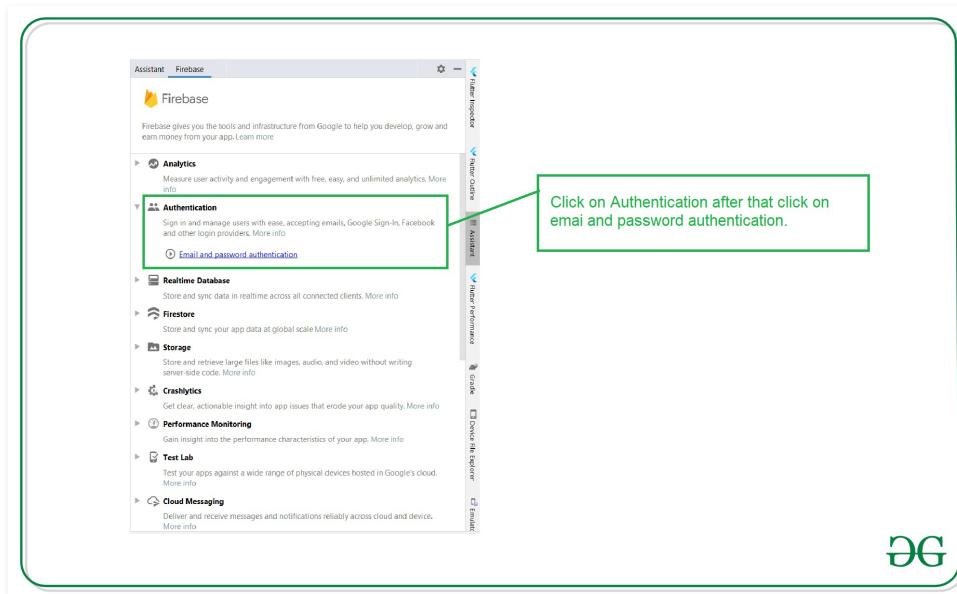
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[Project in Android Studio](#). Note that select **Java** as the programming language.

Step 2: Connect your app to Firebase

After creating a new project in Android Studio connect your app to Firebase. For connecting your app to firebase. Navigate to Tools on the top bar. After that click on Firebase. A new window will open on the right side. Inside that window click on Authentication and then email and password authentication.



After clicking on email and password authentication you will get to see the below screen. Inside this screen click on the first option connect to firebase and after that click on the second option to add Firebase authentication to your app.

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```

① Add Firebase Authentication to your app
Add Firebase Authentication to your app

To use an authentication provider, you need to enable it in the Firebase console. Go to the 1 page in the Firebase Authentication section to enable Email/Password sign-in and any other you want for your app.

② Check current auth state
Declare an instance of FirebaseAuth
private FirebaseAuth mAuth;

In the onCreate() method, initialize the FirebaseAuth instance.
mAuth = FirebaseAuth.getInstance();

When initializing your Activity, check to see if the user is currently signed in.
.....
public void onStart() {
    mAuth.onStart();
}

```

Click on second option to add Firebase Authentication to your app and it will ask to add dependancies to your app.



Step 3: Verify that dependency for Firebase authentication is added inside your app

After connecting your app to Firebase. Make sure to add this dependency in your [build.gradle](#) file if not added. After adding this dependency sync your project.

```

dependencies {
    implementation 'androidx.appcompat:appcompat:1.2.0'
    implementation 'com.google.android.material:material:1.2.1'
    implementation 'androidx.constraintlayout:constraintlayout:2.0.4'
    implementation 'com.google.firebaseio:firebase-database:19.6.0'
    implementation 'com.google.firebase:firebase-auth:19.3.2'
    testImplementation 'junit:junit:4.+'
    androidTestImplementation 'androidx.test.ext:junit:1.1.2'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.3.0'
}

```

This is the dependency for Firebase Authentication. Make sure to add this dependency in your app if not present.



Note: Make sure to add the exact dependency version in the above image because the latest dependency is not having the implementation for **auto-detection of OTP**.

Step 4: Working with the activity_main.xml file

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```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <!--EditText for getting users phone number-->
    <EditText
        android:id="@+id/idEdtPhoneNumber"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_margin="10dp"
        android:hint="Enter your phone"
        android:importantForAutofill="no"
        android:inputType="phone" />

    <!--Button for getting OTP-->
    <Button
        android:id="@+id/idBtnGetOtp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"

```



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```

    <!--EditText for getting otp from user-->
    <EditText
        android:id="@+id/idEdtOtp"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/idEdtPhoneNumber"
        android:layout_margin="10dp"
        android:hint="Enter OTP"
        android:importantForAutofill="no"
        android:inputType="phone" />

    <!--button for verifying user OTP-->
    <Button
        android:id="@+id/idBtnVerify"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/idEdtOtp"

```

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Navigate to the **app > AndroidManifest.xml** file and add the below permissions to it.

XML

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

Step 6: Create a new Activity for our Home Page

Navigate to the **app > java > your app's package name > Right-click on your app's package name and click on New > Activity > Empty Activity** and name your activity. Here we have given it a name as **HomeActivity**.

Step 7: Working with the MainActivity.java file

Go to the **MainActivity.java** file and refer to the following code. Below is the code for the **MainActivity.java** file. Comments are added inside the code to understand the code in more detail.

Java

```
import android.content.Intent;
import android.os.Bundle;
import android.text.TextUtils;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import com.google.android.gms.tasks.OnCompleteListener;
import com.google.android.gms.tasks.Task;
import com.google.android.gms.tasks.TaskExecutors;
```

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```

private FirebaseAuth mAuth;

// variable for our text input
// field for phone and OTP.
private EditText edtPhone, edtOTP;

// buttons for generating OTP and verifying OTP
private Button verifyOTPBtn, generateOTPBtn;

// string for storing our verification ID
private String verificationId;

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    // below line is for getting instance
    // of our FirebaseAuth.
    mAuth = FirebaseAuth.getInstance();

    // initializing variables for button and Edittext.
    edtPhone = findViewById(R.id.idEdtPhoneNumber);
    edtOTP = findViewById(R.id.idEdtOtp);
    verifyOTPBtn = findViewById(R.id.idBtnVerify);
    generateOTPBtn = findViewById(R.id.idBtnGetOtp);

    // setting onclick listener for generate OTP button.
    generateOTPBtn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            // below line is for checking weather the user
            // has entered his mobile number or not.
            if (TextUtils.isEmpty(edtPhone.getText().toString())) {
                // when mobile number text field is empty
                // displaying a toast message.
                Toast.makeText(MainActivity.this, "Please enter a valid"
            } else {
                // if the text field is not empty we are calling our
                // send OTP method for getting OTP from Firebase.
                String phone = "+91" + edtPhone.getText().toString();
                sendVerificationCode(phone);
            }
        }
    });
}

```

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```

        // a message to user to enter OTP
        Toast.makeText(MainActivity.this, "Please enter OTP", I
    } else {
        // if OTP field is not empty calling
        // method to verify the OTP.
        verifyCode(edtOTP.getText().toString());
    }
}

private void signInWithCredential(PhoneAuthCredential credential) {
    // inside this method we are checking if
    // the code entered is correct or not.
    mAuth.signInWithCredential(credential)
        .addOnCompleteListener(new OnCompleteListener<AuthResult>()
            @Override
            public void onComplete(@NonNull Task<AuthResult> task)
                if (task.isSuccessful()) {
                    // if the code is correct and the task is succe
                    // we are sending our user to new activity.
                    Intent i = new Intent(MainActivity.this, HomeAc
                    startActivity(i);
                    finish();
                } else {
                    // if the code is not correct then we are
                    // displaying an error message to the user.
                    Toast.makeText(MainActivity.this, task.getException()
                }
            }
        );
}

private void sendVerificationCode(String number) {
    // this method is used for getting
    // OTP on user phone number.
    PhoneAuthOptions options =
        PhoneAuthOptions.newBuilder(mAuth)
            .setPhoneNumber(number)                      // Phone number
            .setTimeout(60L, TimeUnit.SECONDS)           // Timeout and t
            .setActivity(this)                          // Activity (for
            .setCallbacks(mCallBack)                   // OnVerificatio
}

```

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```

// below method is used when
// OTP is sent from Firebase
@Override
public void onCodeSent(String s, PhoneAuthProvider.ForceResendingToken
    super.onCodeSent(s, forceResendingToken);
    // when we receive the OTP it
    // contains a unique id which
    // we are storing in our string
    // which we have already created.
    verificationId = s;
}

// this method is called when user
// receive OTP from Firebase.
@Override
public void onVerificationCompleted(PhoneAuthCredential phoneAuthC
    // below line is used for getting OTP code
    // which is sent in phone auth credentials.
    final String code = phoneAuthCredential.getSmsCode();

    // checking if the code
    // is null or not.
    if (code != null) {
        // if the code is not null then
        // we are setting that code to
        // our OTP edittext field.
        edtOTP.setText(code);

        // after setting this code
        // to OTP edittext field we
        // are calling our verifycode method.
        verifyCode(code);
    }
}

// this method is called when firebase doesn't
// sends our OTP code due to any error or issue.
@Override
public void onVerificationFailed(FirebaseException e) {
    // displaying error message with firebase exception.
    Toast.makeText(MainActivity.this, e.getMessage(), Toast.LENGTH_
}
;

```

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}

Step 8: Working on HomeActivity

Now we have authenticated our user and move towards our Home Activity. Now we will display a welcome message to our user on successful authentication. For this Navigate to the **app > res > layout > activity_home.xml** and add the below code to it.

XML

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".HomeActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:padding="10dp"
        android:text="Geeks for Geeks \n Welcome to Home Screen"
        android:textAlignment="center"
        android:textColor="@color/purple_500"
        android:textSize="20sp" />

</RelativeLayout>
```

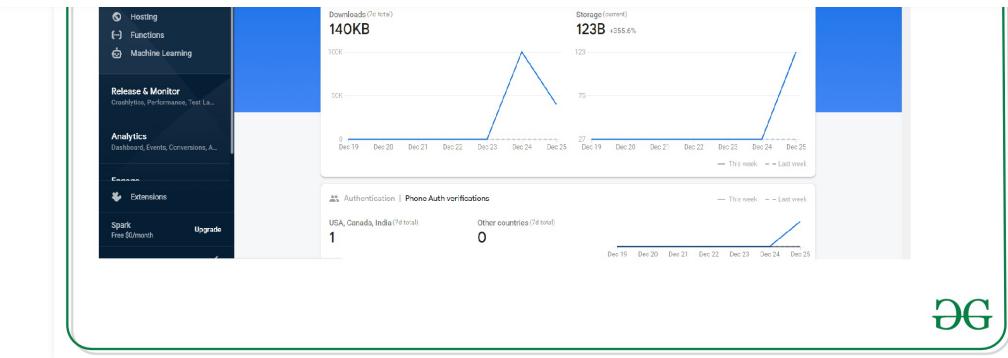
Step 9: Enable Firebase Phone Authentication in our Firebase Console

For enabling Phone authentication in the Firebase console go to the [Firebase Console](#). Now click on **Go to Console** option and navigate to your project. After that click on your project. You can get to see the below screen.

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After clicking on Authentication you will get to see the below screen. On this screen click on the Sign-in method tab.

The screenshot shows the Authentication section of the Firebase Project Overview. A callout box highlights the 'Sign-in method' tab, which is currently selected. The interface shows a table with columns for Identifier, Providers, Created, Signed In, and User ID. A message at the bottom says, "★ You can manually add users by enabling email/password as a sign-in provider".

After clicking on Sign in-method you will get to see below list of authentication screens. Click on the Phone option and enable it.

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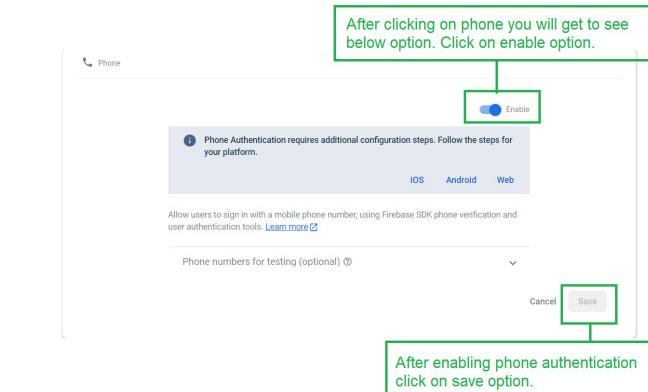
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	Google	Disabled
	Play Games	Disabled
	Game Center	Disabled
	Facebook	Disabled
	Twitter	Disabled
	Github	Disabled
	Yahoo	Disabled
	Microsoft	Disabled



Click on the Phone option and you will get to see the below pop-up screen. Inside this screen click on the enable option and save it.



Note: For getting OTP don't enter your phone number with country code because we are already adding that country code in our code itself.

Output:

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