

# Documentation

# How to Use

You only need Android Studio to open the package.

The simplest way to test the program is to connect your mobile phone with your computer via cable. Also the phone needs to have developer mode activated.

For myself I needed to go to: Settings > About Phone > Software Info > Build Number and tap it seven times.

Then you need to go to click on your connection with the computer and change it to transfer files. A Pop-up should appear asking to enable debugging. After pressing OK you can return to the computer.

If your phone appears on the IDE you can start the program.

To lookup the internal file browser navigate to: View > Tool Windows > Device File Explorer

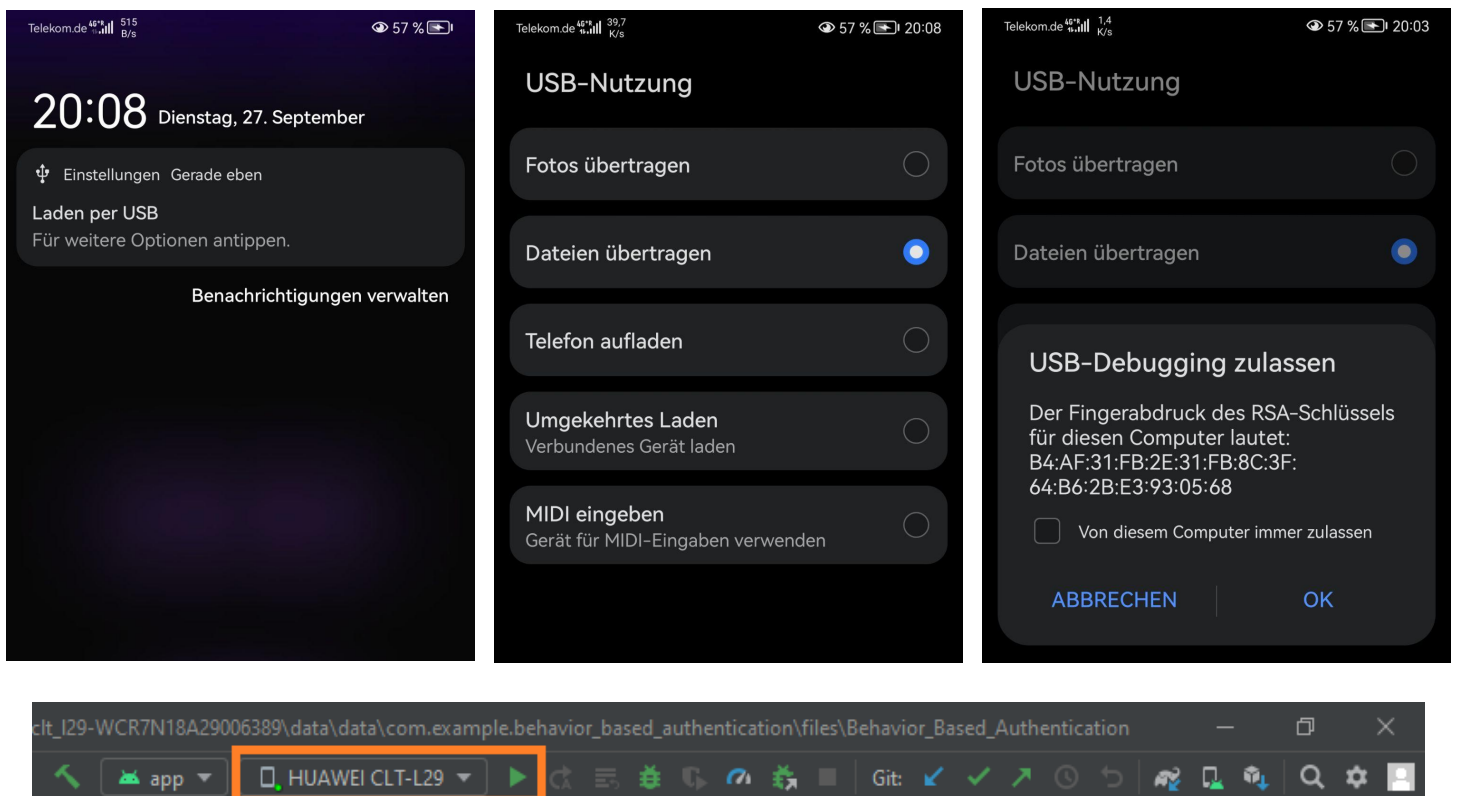
In the File Explorer you can find the File under: data > data >

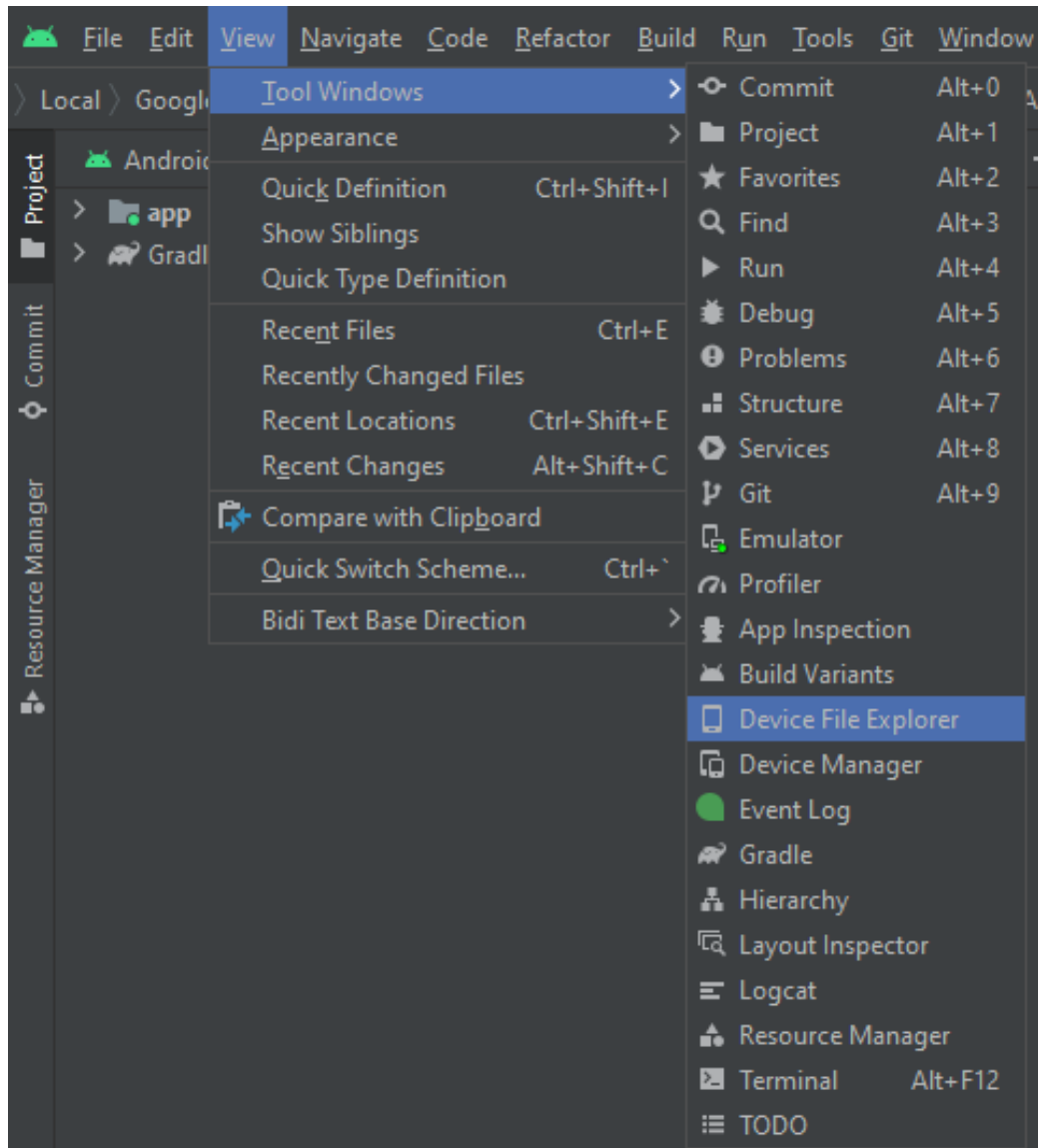
com.example.behavior\_based\_authentication > files > Behavior\_Based\_Authentication

After starting the APP and clicking on START, a lot of features need to be allowed. Especially click on always allow when asked about the location. If you don't do that, the location may not work in the background.

The START button is for starting the foreground service and the STOP button for closing it again. You can start the service, close the app and the service will still run. To close the service again, you have to open the app and click on STOP.

The NEW ACTIVITY exists to test touch inputs outside of the MainActivity scope.





Device File Explorer			
HUAWEI CLT-L29 Android 10, API 29			
Name	Permissions	Date	Size
> com.example.android.notepad	drwxrwx--x	2022-09-26 23:27	4 KB
> com.example.authentication	drwxrwx--x	2022-09-26 23:27	4 KB
▼ com.example.behavior_based_authentication	drwxrwx--x	2022-09-26 23:27	4 KB
> cache	drwxrws--x	2022-09-27 20:06	3.4 KB
> code_cache	drwxrws--x	2022-09-27 20:06	3.4 KB
▼ files	drwxrwx--x	2022-09-29 03:48	3.4 KB
Behavior_Based_Authentication	-rw-----	2022-09-29 07:56	15.2 KB
hw_cached_resid.list	-rw-----	2022-09-29 03:48	38 B

## Behavior-Based-Authentication



Zulassen, dass  
Behavior-Based-Authe... jederzeit  
auf Ihren Standort zugreift?

Derzeit kann die App nur während der  
Nutzung auf den Standort zugreifen.

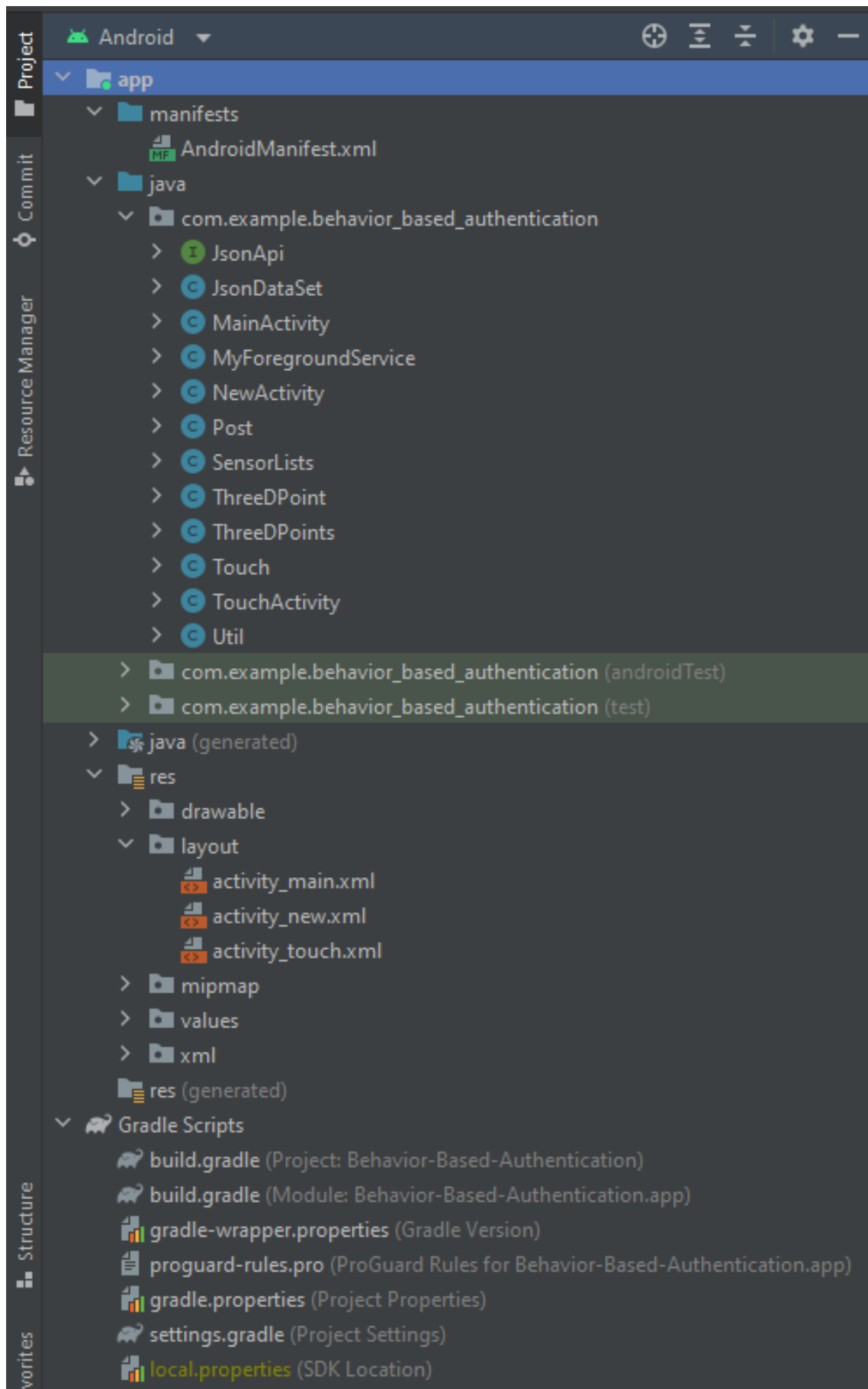
**IMMER ZULASSEN**

**ZUGRIFF WÄHREND DER VERWE...**

**BEIBEHALTEN UND NICHT MEHR ...**

NEW ACTIVITY

# The Project



## Description

The Project consists mainly of a manifest file, java classes, activities and the gradle scripts.

The manifest contains the permissions a user has to provide to use this application.

Java classes contain the executable code.

Activities contain the layout and components of the GUI.

Gradle is a Toolkit and it contains the dependencies of other libraries.

## MainActivity

The program starts in the MainActivity. When the MainActivity gets created, the buttons are being initialised. If START is pressed, the permissions are getting verified and requested if missing. Then the foreground service is getting started.

The STOP button creates a new service and stops it immediately.

The NEW ACTIVITY button just creates a new activity.

## TouchActivity

All classes of activities extend the TouchActivity. It stores and logs touch inputs, which it sends through a broadcast to MyForegroundService.

## MyForegroundService

The foreground service is the most important class. On creation the service starts the location updates, registers the receiver for touch inputs and starts on a timer to save data locally and send data over REST API.

On command start the available sensors are being compared to the SensorLists. The right ones are being registered.

OnSensorChanged gets called every time a sensor has a new value. If the new value is too new, it gets dropped. Like the touch data, the sensor data gets stored into a list.

Every timerDelay the wifi, touch, location and sensor data is getting converted into a json.

The json then gets saved and sent to a test URL.

## JsonApi & JsonDataSet

Both are fundamental for the REST API and for the json that gets posted.

## ThreeDPoint & ThreeDPoints

Both are used to save sensor data.

## NewActivity

Basic activity to test touch inputs for outside of the main activity.