

1. Developing the Unique GPS tracking device to track the Realtime positions of the trains
 - 1.1. Choosing the most suitable microcontroller and GPS module (ESP32 AM-036 and Neo M8N module)
 - 1.2. Increasing the GPS coordinates reading accuracy up to 3.5m (Integrating the advanced filtering methods)
 - 1.3. Realtime reading data storing in the google sheet for access the backend functionalities
2. Obtaining the actual coordinates on two parallel train tracks between selected two close stations.
 - 2.1. Use the OpenStreetMap (OSM) and python.
 - 2.2. Extract only the actual coordinates using the advanced methods.
 - 2.3. Identifying the unique two data sets related to two lines. (Line_01 and Line_02)
 - 2.4. Plotting the map using extracted coordinates on OSM for validation.
3. Identifying a line as an active section, when a train entering to a line.
 - 3.1. If a device read coordinates which related to Line_01 or Line_02, it identify the that line is active.
4. If two trains entering to a same line section, it is acritical situation.
 - 4.1. During one line section is active (it means that line is occupied by a train), if another train is entered to that line section proposed solutions must be taken.
 - 4.2. Mainly the two device's buzzers, which trains under the risky situation, must be active and warn to the engine drivers.
 - 4.3. Also, the critical situation should showcase in the main controlling center in developed UI, with locations and trains.