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Microcontroller

Submitted by

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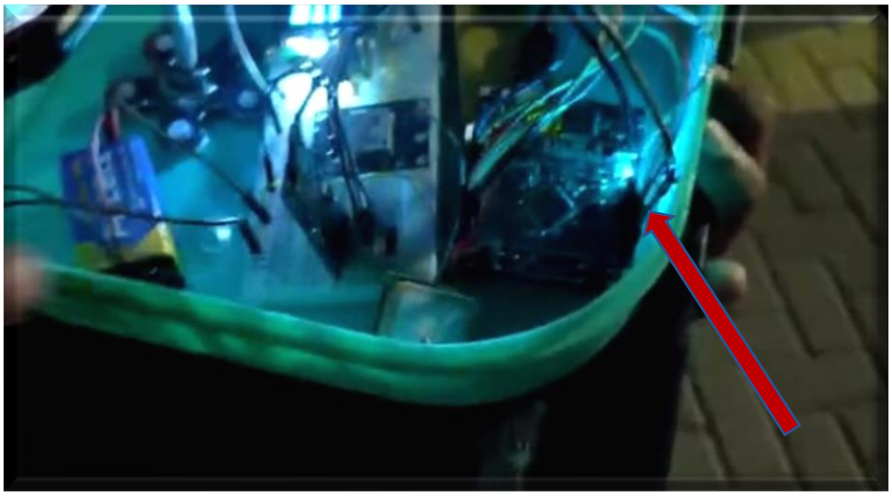
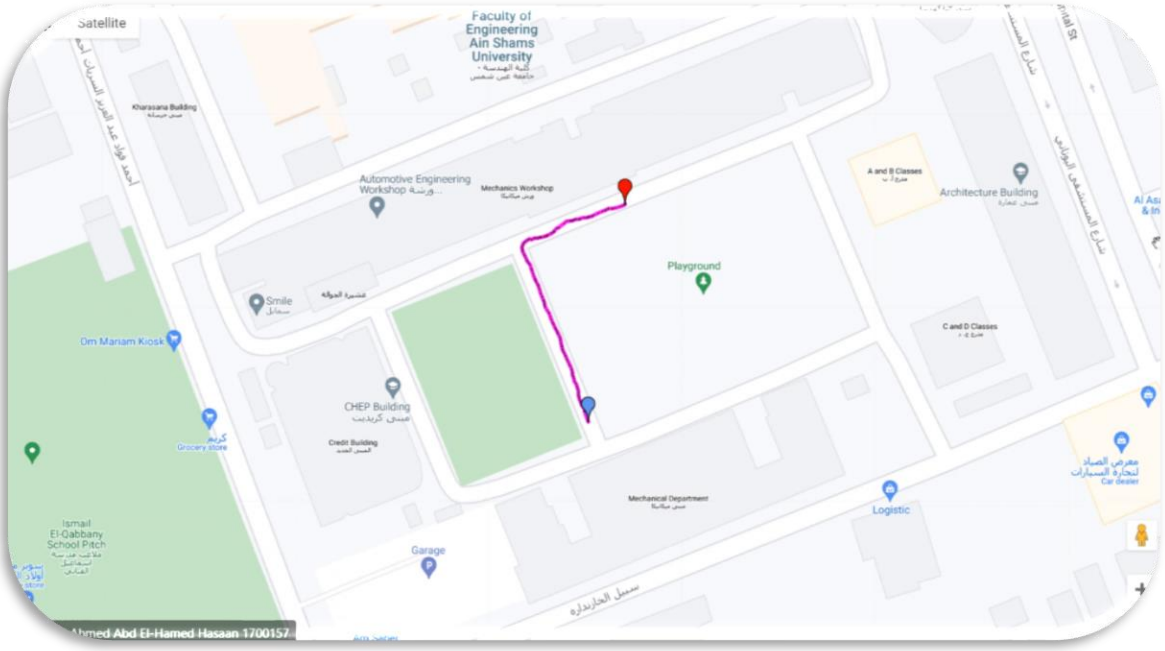
output screenshots:

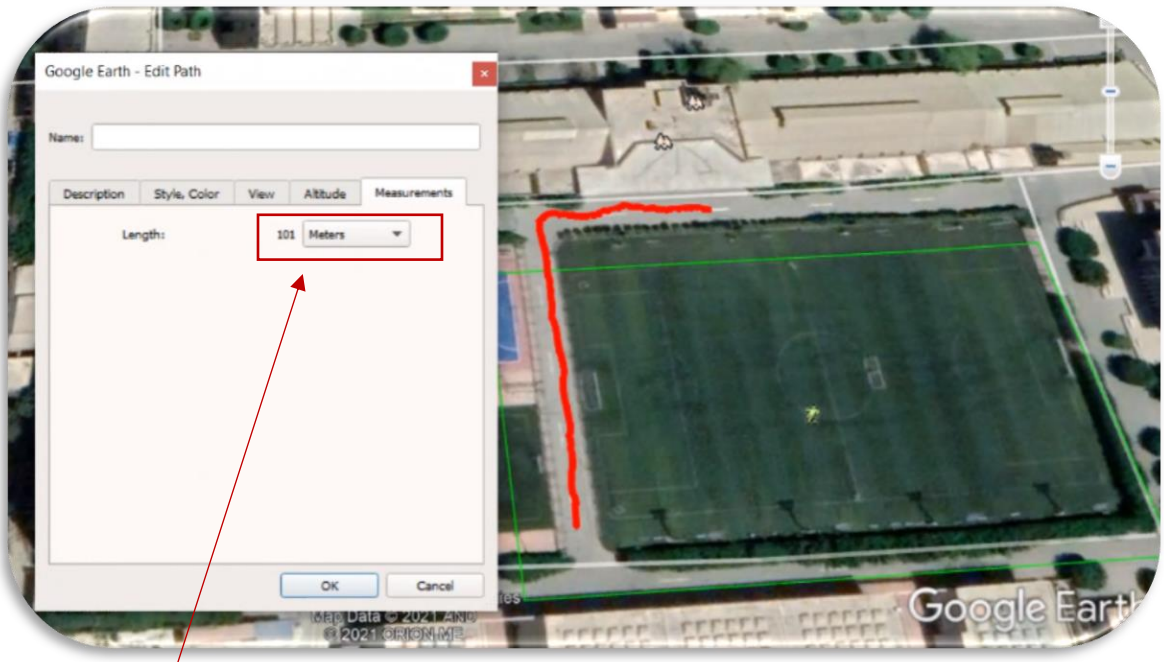
After reaching the destination point (100 m), blue led is turned on.



Using Python Script for drawing (plotting) our track:



Using Google Earth for drawing (plotting) our track:



The distance between the starting point and the end point calculated by our software is 101 m.

Description:

- GPS Tracking System read the coordinates (Longitude, Latitude, Altitude), then calculate the distance.
- Show the calculated distance on **LCD**.
- Save the coordinates (Longitude, Latitude, Altitude) of our track, on the SD card in files: Python Script , locate.kml & locate.csv.
- Python script file gets the data from locate.csv file and plots points of our track on google maps by creating HTML file and mark the starting & ending points.
- locate.kml file contains the coordinates to later be drawn on Google Earth APP.
- Then Python script file open the html and locate.kml file.
- locate.csv contains columns of Longitude & Latitude.


```
import pandas as pd
import os, sys, string

df = pd.read_csv (r'LOCAT.CSV')
lat =df['latitude'].tolist()
lon =df['longitude'].tolist()

# Create the map plotter:
gmap = gmplot.GoogleMapPlotter(lat[0], lon[0], 18, apikey="AIzaSyDTs6doYJbA3xZ16pIH1AzJKcdwkWGX-o0")

gmap.scatter(lat, lon, color='#3B0B39', size=0.2, marker=False)
gmap.plot(lat,lon,'#ff00f0',edge_width=5)

# Mark a hidden gem:
gmap.marker(lat[0], lon[0], color='cornflowerblue')
gmap.marker(lat[-1], lon[-1], color='#ff0000')

# Draw the map:
gmap.draw('map.html')
os.startfile("LOCAT.KML")
os.startfile("map.html")
```

Python script

```
<kml>
<Document>
    <Style id="yellowPoly">
        <LineStyle>
            <color>ff0000ff</color>
            <width>6</width>
        </LineStyle>
        <PolyStyle>
            <color>7f00ff00</color>
        </PolyStyle>
    </Style>
    <Placemark>
        <styleUrl>#yellowPoly</styleUrl>
        <LineString>
            <altitudeMode>relativeToGround</altitudeMode>
            <coordinates>
                31.279116,30.063395,38.200000
                31.279104,30.063427,39.200000
                31.279104,30.063427,39.100000
                31.279104,30.063428,39.200000
                31.279105,30.063431,39.200000
                31.279102,30.063436,39.300000
                31.279099,30.063441,39.200000
                31.279093,30.063448,39.200000
                31.279090,30.063455,39.100000
                31.279087,30.063461,38.900000
                31.279086,30.063467,38.600000
```

KML file

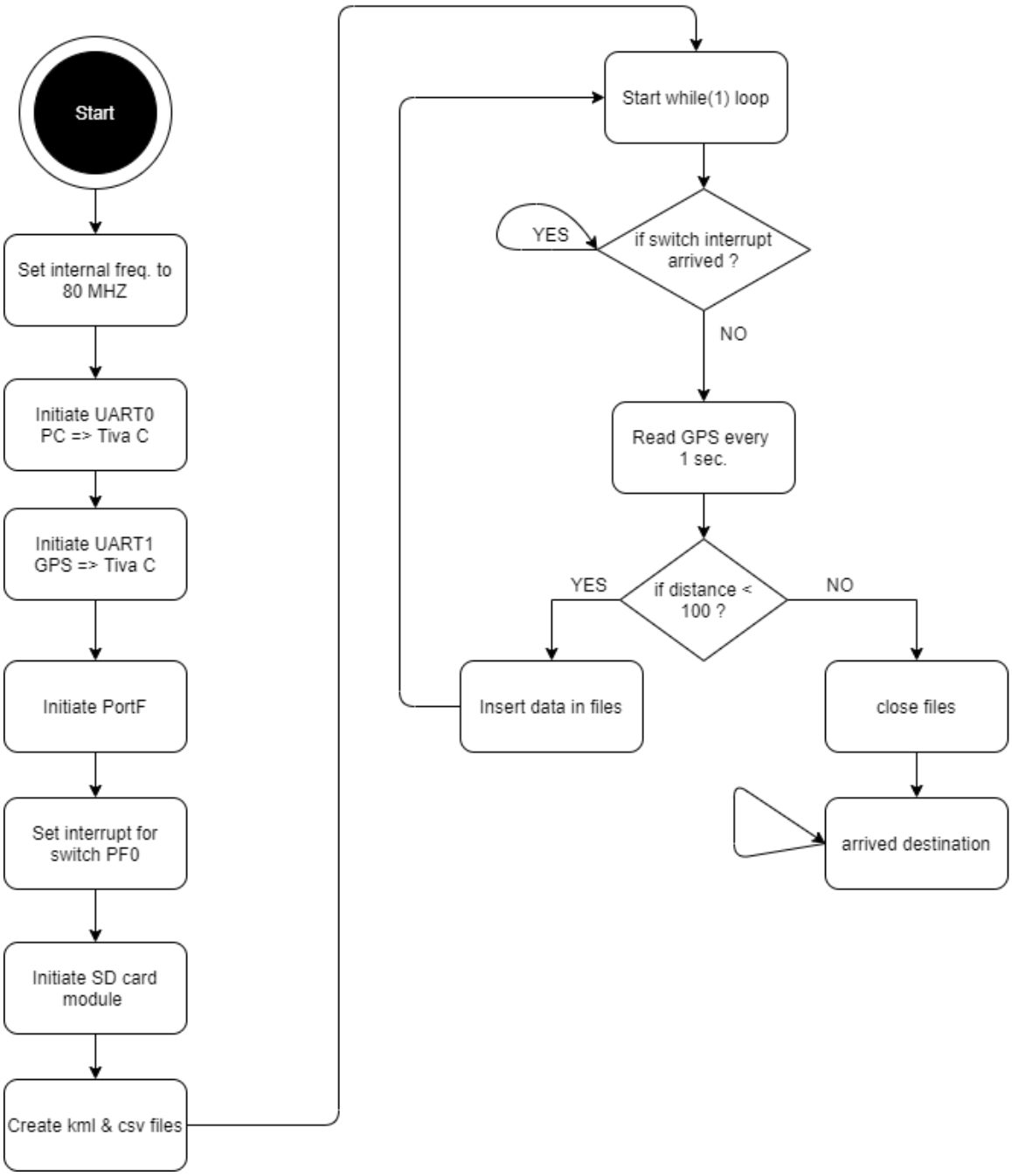
longitude	latitude	altitude
31.27912	30.0634	38.2
31.2791	30.06343	39.2
31.2791	30.06343	39.1
31.2791	30.06343	39.2
31.27911	30.06343	39.2
31.2791	30.06344	39.3
31.2791	30.06344	39.2
31.27909	30.06345	39.2
31.27909	30.06346	39.1
31.27909	30.06346	38.9
31.27909	30.06347	38.6
31.27908	30.06347	38.3
31.27908	30.06348	38.1
31.27908	30.06348	37.8
31.27908	30.06349	37.4
31.27908	30.0635	37.3
31.27908	30.06351	37.3
31.27907	30.06351	37.2
31.27907	30.06352	36.9
31.27907	30.06353	36.7
31.27906	30.06353	36.7

```
longitude,latitude,altitude
31.279116,30.063395,38.200000
31.279104,30.063427,39.200000
31.279104,30.063427,39.100000
31.279104,30.063428,39.200000
31.279105,30.063431,39.200000
31.279102,30.063436,39.300000
31.279099,30.063441,39.200000
31.279093,30.063448,39.200000
31.279090,30.063455,39.100000
31.279087,30.063461,38.900000
31.279086,30.063467,38.600000
31.279084,30.063473,38.300000
31.279082,30.063478,38.100000
31.279082,30.063484,37.800000
31.279081,30.063491,37.400000
31.279079,30.063498,37.300000
31.279076,30.063505,37.300000
31.279074,30.063512,37.200000
31.279069,30.063519,36.900000
31.279067.30.063528.36.700000
```

CSV File

Diagrams of the project:

Main program



Interrupt service: