CSE211s [Spring 2024]

Introduction to Embedded Systems

TEAM 9

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Project description:

The goal of this project is to develop an embedded system using C programming that gathers real-time positional coordinates while a microcontroller is in motion (GPS tracking system using TM4C123G LaunchPad) after power-on until a destination point is reached. The collected data will then be efficiently transferred to a personal computer (PC) and visualized on a map application.

Components Used:

- TM4C123G LaunchPad
- NEO 6M GPS module
- A personal computer (PC)
- Connecting cables (USB, serial, etc.)
- LCD

Software Used:

- **Keil** for building and loading C code on tiva
- **Visual Studio code** for running python code used in plotting the coordinates on Map

How project works:

- The GPS subsystem stores the coordinates of the start point.
- The destination point is entered into the program as coordinates.
- If the distance is greater than 20 the LED is red, When we are within 10 to 20 meters from destination point LED turns blue and when we reach destination the LED turns green.
- After reaching the destination point, the GPS subsystem stores the coordinates of the end point and calculates the total distance that was taken by the user.
- After the destination is reached and we press U in python the latitudes of all points taken by GPS periodically are sent using UART to the python code followed by "latdone" then all longitudes are sent followed by "logdone" then python plot these points on the map using folium
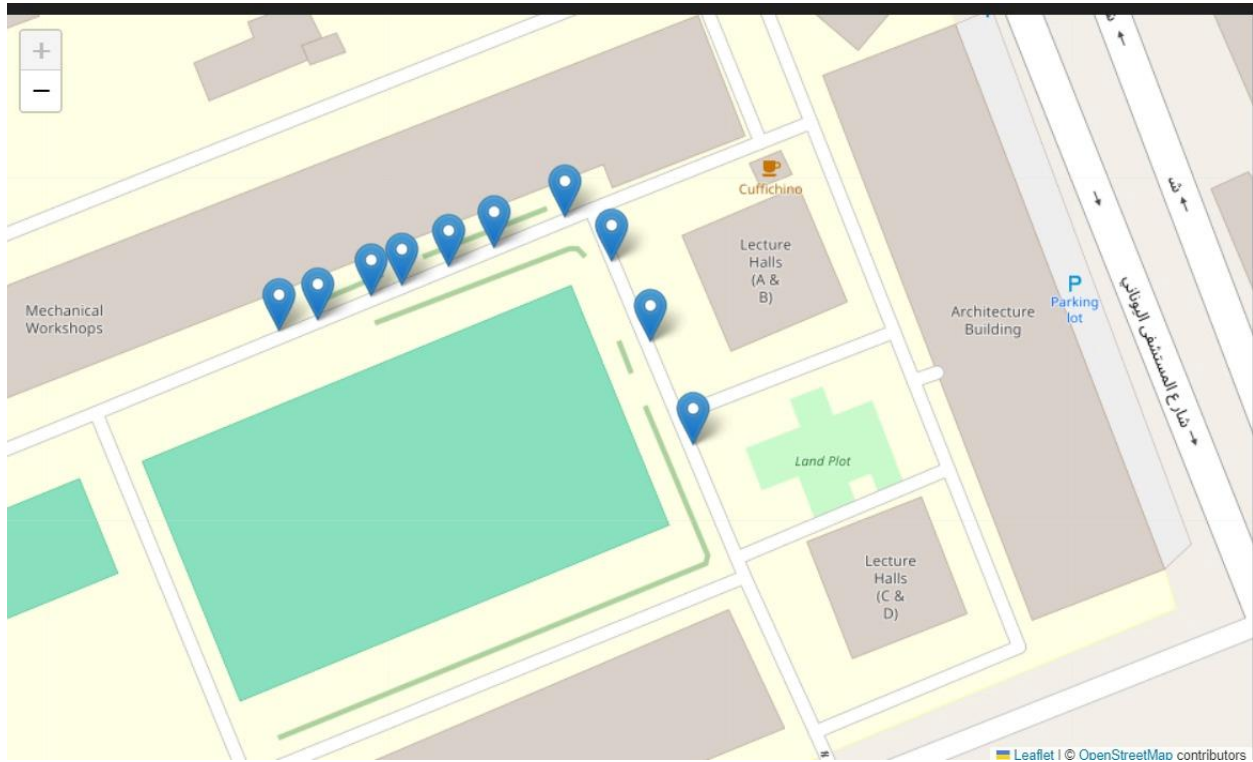
GPS connection:

-Tx --> Pe4

-Rx --> Pe1

LCD connection:
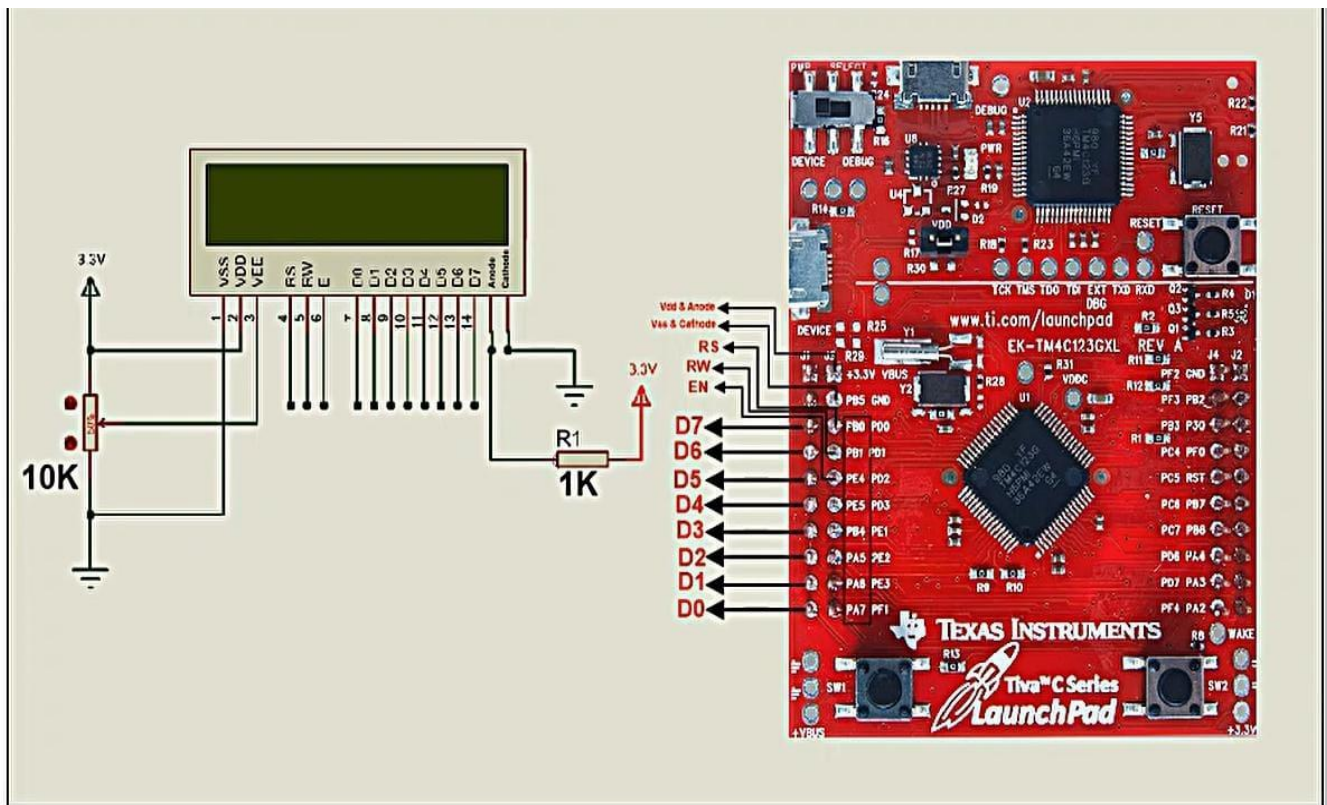
Python code output:

Important links:

[Github repo](#)

[Zipped code](#)

[Without_Readings(final_destination)Video](#)

[Without_Readings(final_destination_first)Video](#)

[Final_Video](#)