Basic Information

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- Country/ Region: Durgapur, India

University and Current Enrollment:

- University: National Institute of Technology, Durgapur
- Field of Study: Electronics and Communication Engineering (Will Graduate in 2021)

Title

MicroPython examples and tools for Portenta H7.

Abstract

Portenta H7 is a multiprocessor microcomputer which can run multiple tasks at once. MicroPython helps in building tools and programming this board. To make it the most powerful board we incorporate the most powerful tools with documentation and also general-purpose board.

Technical Details

Micropython

MicroPython is a programming language that can directly interact with a microcontroller. It is written in **C**, syntaxes are nearly equivalent to Python3.

BLE Devices

BLE devices consumes low power as compared classic Bluetooth devices. It is used for minor data exchange and can't be used for continuous data flow. It can be used in smart applicances(e.g.smart bulbs etc.,) and smart bands etc.

Wireshark

Wireshark is a packet analyzer used to analyze Bluetooth or wifi data packets. It helps us in troubleshooting, communicating with devices.

Deliverables

1. Board Setup
    1. Learning and Practicing MicroPython.
    2. Interfacing the external peripherals with Portenta.
    3. Debugging interface with external peripherals.

2. Examples of MicroPython for Portenta

    1. Creating a Github Repository for hosting the examples.
    2. Converting standard Arduino examples into MicroPython for Protenta.

3. Tools for Portenta

    1. Implementation of Bluetooth low energy device scanner and interface with Portenta board.
    2. Implementation of tools like Nmap, Wireshark which enables the board to use for pen-testing purposes also.

Timeline

Dates	Tasks
May 4th to May 31st	• Community Bonding Period • Communicating with the mentor about my experiences and asking for prerequisites
June 1st to June 15th	• Learning and Practicing MicroPython • Interfacing the external peripherals with Portenta.
June 16th to June 30th	• Debugging interface with external peripherals • Creating a Github Repository for hosting the examples and hosting basic examples.
July 1st	Phase 1 Evaluation
July 2nd to July 15th	• Writing advanced examples in MicroPython • Converting standard Arduino examples into MicroPython for Protenta
July 16th to July 30th	• Implementation of Bluetooth low energy device scanner and interface with Portenta board. • Testing and Debugging BLE scanner
July 31st	Phase 2 Evaluation
August 1st to August 15th	• Implementation of tools like Nmap, Wireshark which enables the board to use for pen-testing purposes also. • Converting standard Arduino examples into MicroPython for Protenta

Dates	Tasks
August 16th to August 30th	• Implementation of Bluetooth low energy device scanner and interface with Portenta board. • Testing and Debugging Wireshark and other tools • Documentation
August 30th or 31st	Final Submission

Community Bonding Period

- In the community bonding period, I will be getting familiar with the programming style guide that your organization uses.
- Discussion and planning work with a mentor.
- Planning for weekly calls/meetings to discuss weekly works and updates of work.

Phase 1 Deliverable before the first Mid-Term evaluation

- Debugging interface with external peripherals with MicroPython on Protenta
- Examples on interfacing with hardware components

Phase 2 Deliverable before the second Mid-Term evaluation

- Implementation of Bluetooth Low Energy ***(B.L.E.)*** device scanner and interface with the Portenta board.
- Examples on how to use the **B.L.E.** interface tool.

Final Week

- Implementation of tools like Nmap, Wireshark which enables the board to use for pen-testing purposes also.
- Making the final documentation of tools and linking it with the examples written so that a beginner can understand

Development Experience

Yes, I code on Github. Here are some of my contributions.

1. Making Presentation slider with Mi Band
2. Voice Assistant (Alexis)

Below are some of the projects I made with Arduino and NodeMCU.

1. Tap Keyboard (Keyboard for blind)
2. Fire Fighting Autonomous Robot
3. Gas Leakage Notifier

Other Experiences

- Part of the Web Application Team at Reliance Industries Limited (R.I.L.)
- Programmer and Project Designer at RnD CCA, NIT Durgapur

Why this project?

I like to work on hardware development. My interests and experience and knowledge made me choose this project.

Do you have any other commitments during the GSoC period?

During GSOC I don't have any other commitments. Due to COVID-19 if there is a reschedule in my academic examination I may need a break of 15 days.