GSET - Programming with Mr. Hill - Summer 2021

Introduction to C++ - Rocket Design Challenge - Brainstorm

Mission Overview:

The goal is to send a rocket into space and collect as data about the flight of the rocket and the environmental conditions throughout the flight. There are many design aspects required for this mission to be successful.

- **Fuselage Design:** The rocket will be constructed of materials available at TNTech.
- **Propulsion and Control Design:** The rocket should fly as high as possible in a controlled manner.
- **Electronics Design:** Useful data regarding the rocket flight and environment should be collected for post flight analysis.
- **Measurement and Data Analysis Design:** The data collection and analysis should be relevant to the mission.

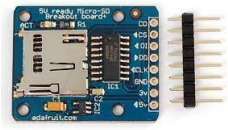
Available Hardware: A prototype of the rocket must be completed in time to launch and analyze the acquired data. The following hardware is available for experimentation and use in the prototype rocket.

- **Propulsion:** Estes c-65, solid fuel rocket engines and ignitors.
- **Fuselage:** Various 3D printing plastics, various laser cutting materials, traditional machining materials
- **Electronics:**
  - On-board Computer:


    1. Arduino Nano328p
    2. Arduino MKR1010wifi
  - Flight Data Measurement System:


    * BNO055 Absolute Orientation Sensor
    * GY-521 (ITG/MPU)
  - Environment Data Measurement System:


    * DPS310 Temperature and Barometric Pressure Sensor
    * GY-68 (BMP180) Barometric Pressure, Temperature and Altitude Sensor
  - Data Storage System:




    * 5v Ready SD Card Breakout Board
    * 8G or 16G micro SD card (SDHC)

Part 1 - Initial Brainstorm:

Generate initial ideas about the mission as a group and document the promising design ideas.