CanSat Group Roles & Responsibilities

This breakdown outlines the primary responsibilities for each member of your 6-person CanSat group. Remember, **teamwork and communication are key!** Share your progress, challenges, and pin assignments regularly.

Important Note: If any soldering is required for your specific tasks, please complete it by tomorrow. Coordinate with your team and instructors for support.

Person 1: Parachute & Deployment System Lead parachutes

Your mission is to ensure a safe landing for your CanSat!

- **Task 1: Parachute Design & Testing:**
  - Watch videos (**Example Video**) on parachute design and deployment for CanSats.
  - Construct a functional parachute. Test its deployment using a simple bottle or weight to ensure it opens correctly. Experiment with folding techniques for reliable deployment.
- **Task 2: Servo-Based Deployment Mechanism:**
  - Using the SG90 servo (from previous BOR workshops), design a mechanism that can deploy the parachute. Think about how the servo will release the parachute effectively.
- **Timeline:** Aim to complete design and initial testing of both the parachute and the servo mechanism within the next two days.

Person 2: Core Sensor Integration Lead (MPU, GPS, Compass)

You'll be bringing together the key navigation and motion sensors.

- **Task 1: MPU6500, GPS Module, QMC5883L Integration:**
  - Focus on getting the **MPU6500 (Accelerometer/Gyroscope)**, **Ublox NEO-6M GPS Module**, and **GY-271 QMC5883L (Compass)** to work together with the ESP32.
  - Use the provided code examples and libraries.
- **Task 2: Pin Assignment & Communication:**
  - Identify and finalize the specific ESP32 GPIO pins you will use for each of these sensors (especially for I2C and UART).
  - **Crucially, communicate these selected pins to the rest of your group** so others avoid using the same pins for different components.

Person 3: Environmental Sensor & Data Logging Lead (BMP280, SD Card)

Your role is to ensure critical environmental data is collected and saved.

- **Task 1: BMP280 & INA219 Testing:**
  - First, get the **BMP280 Pressure Sensor** and the **INA219 Current Sensor** working individually with the ESP32. Verify that you are getting sensible readings in the Serial Monitor.
- **Task 2: Micro SD Card Data Saving:**
  - Once sensor readings are stable, implement code to save the data from the BMP280 (and INA219 if time permits) onto the **Micro SD Card Adapter** (using the **32 GB SD Card**). Focus on formatting the data for easy analysis (e.g., CSV format).

Persons 4, 5, & 6: Power System & Structural Integration Team

Your collective task is to build the robust power supply and the physical structure of the CanSat.

- **Task 1: Power Supply Construction:**
  - Build the CanSat's power system:
    - Connect the **18650 Battery** into its **18650 Battery Holder**.
    - Connect the battery holder to the **9/12V UPS Module**.
    - Connect the output of the 9/12V UPS Module to the input of the **5V buck MP1584 Mini Buck Converter**.
    - Ensure the buck converter is adjusted to provide a stable **5V output** to power the ESP32. Use the **DT830B DIGITAL MULTIMETER** to verify the voltage.
  - **Safety First:** Review and adhere to all battery safety guidelines.
- **Task 2: Veroboard Integration:**
  - Plan how all the electronic components (ESP32, sensors, power modules) will be laid out and soldered onto the **Veroboard Double side**.
  - Use the **JST wires**, **Male header pins**, and **Female Header Connectors** to create modular and robust connections where needed.
  - **If soldering is required for these connections, complete it by tomorrow.**
- **Task 3: Structural Assembly with Standoffs:**
  - Using the **Spacer Standoff Screw Threaded Pillar PCB Motherboard Standoffs**, design and assemble a multi-layered structure for your CanSat. This will hold all your Veroboards and components securely within the CanSat's outer shell.

Bonus Challenge: Document Your Journey! 🎥

We'd love to see your progress! If you can **record and share your process and testing videos** with us, Maybe you can make a video about how you faced a problem and then what you did to solve it.
You'll receive a **special treat** from me 🖤!

- [Upload your files here]
- You can upload up to 10 files, with each file being a maximum of 1GB. You can go to the form and upload as many times as you want. So there is no limit.