Work Allocation

**1. Member 1 – Embedded Firmware Development (ESP32)**  
This member focused on programming the ESP32 microcontroller. They were responsible for reading sensor data, processing inputs, and handling the communication protocols required to send and receive data between the hardware and the Blynk platform.

**2. Member 2 – Sensor Integration and Calibration**  
Handled the integration and accurate configuration of the heart rate sensor (PPG), temperature sensor (DS18B20), and accelerometer (ADXL345). Their task was to ensure that all sensor readings were precise and reliable under real-world conditions.

**3. Member 3 – Mobile App Interface (Blynk Dashboard Design)**  
Led the development of the mobile application interface using Blynk. They created the app dashboard layout, set up widgets for data visualization, implemented live tracking features, and ensured that users received real-time alerts.

**4. Member 4 – GPS and Geofencing Implementation**  
Worked with the Neo-6M GPS module and developed the logic for live location tracking and geofencing. They programmed the device to detect when the pet left a designated safe zone and ensured that notifications were triggered accordingly.

**5. Member 5 – GSM Communication Setup**  
Specialized in setting up and configuring the SIM800L GSM module. They tested and ensured reliable data transmission over mobile networks, particularly for outdoor and remote area use where Wi-Fi is not available.

**6. Member 6 – Power Supply and Battery Management**  
Designed the power system using a rechargeable lithium-ion battery. They implemented power-saving features in the firmware and ensured the collar could operate continuously for at least 24 hours without requiring frequent recharging.

**7. Member 7 – Hardware Assembly and Collar Design**  
Was responsible for the physical assembly of the collar. They mounted components onto a compact structure, handled wiring, secured the sensors, and ensured the collar was lightweight, waterproof where possible, and comfortable for pets to wear.

**8. Member 8 – Real-World Testing and Data Logging**  
Conducted testing with pets to evaluate system accuracy and performance in actual environments. They recorded test data, validated alerts, and provided feedback for improvements based on observations and owner feedback.

**9. Member 9 – UI/UX Optimization and User Guide**  
Assisted in improving the Blynk dashboard’s user experience and wrote the user manual for operating the collar and app. They ensured the app interface was clean, intuitive, and easy to understand for users with no technical background.

**10. Member 10 – Final Report, Presentation, and Documentation**  
Compiled the final project report and presentation slides. They documented each stage of development, including methodology, outcomes, challenges, and references, and ensured the project was presented professionally during evaluations.