ASSIGNMENT-3

ESP SWARM AND LED BLINKING

RASPBERRY PI FUNCTION AND EXPLATION:

In the raspberry pi code, the raspberry pi waits to receive a message form the master ESP which sends a packet with all the necessary information (master/slave state, timestamp, reading). The raspberry pi takes this data and processes it and retrieves information, from which the ID of the master is checked to turn on the corresponding LED. The 3 LED are red, green and blue which blink 5 times while still receiving packet from ESP which might be the new master. Once the master changes and the 5 blinking occurrences are done the raspberry pi starts blinking for the next master input it had received. The raspberry pi is also connected to a push button which, when pressed can send a packet to all the ESP to reset them and it will turn on the white LED connected to it for 3 seconds as given in the question.

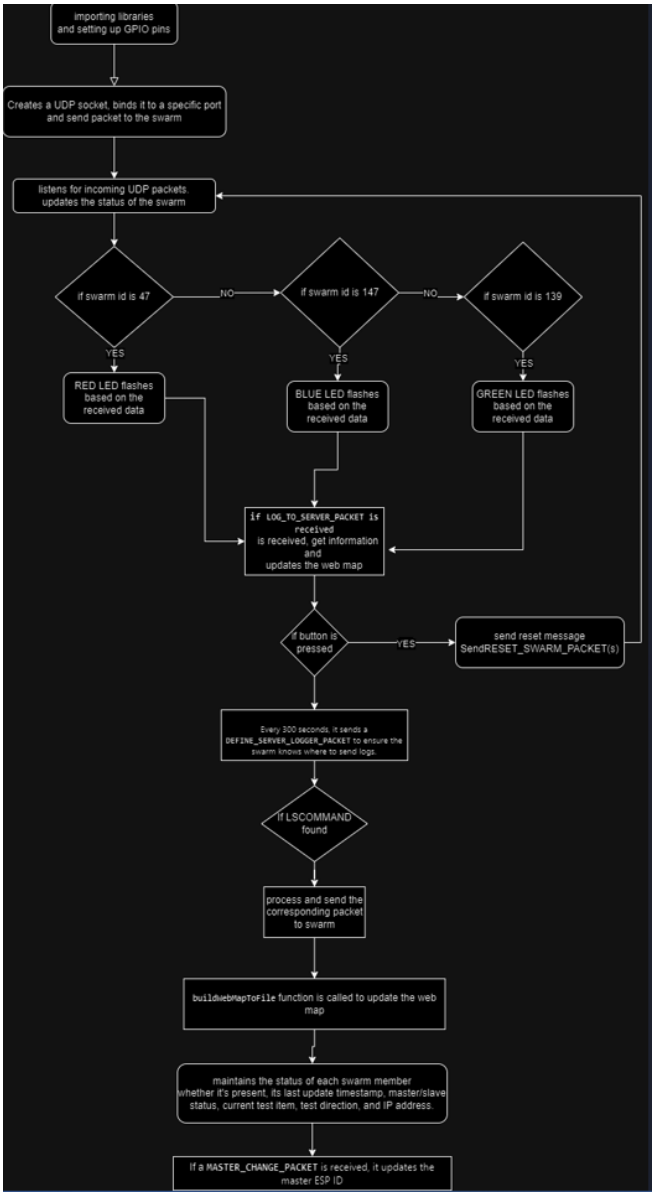


Figure 1: Flow chart for raspberry pi code.

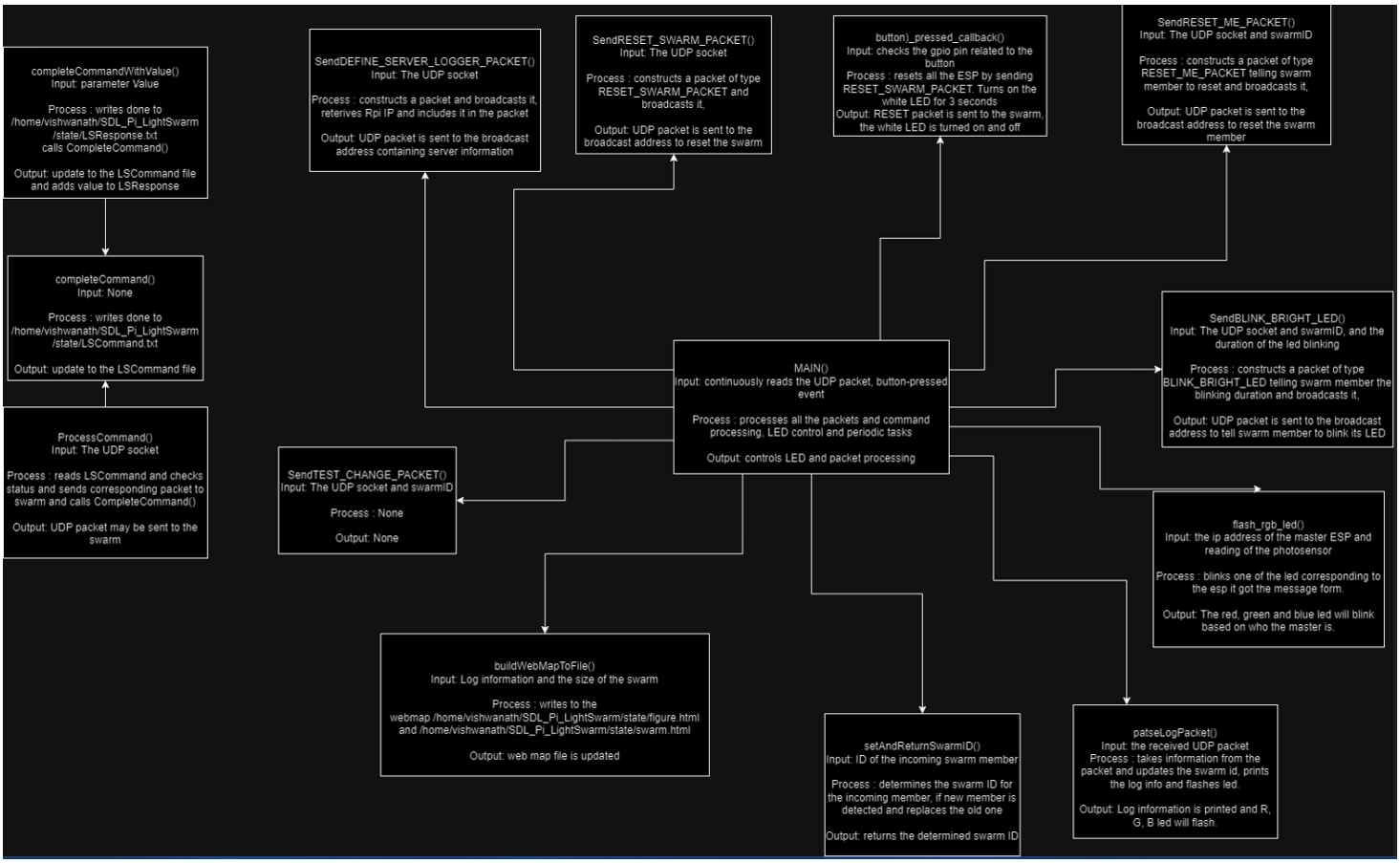
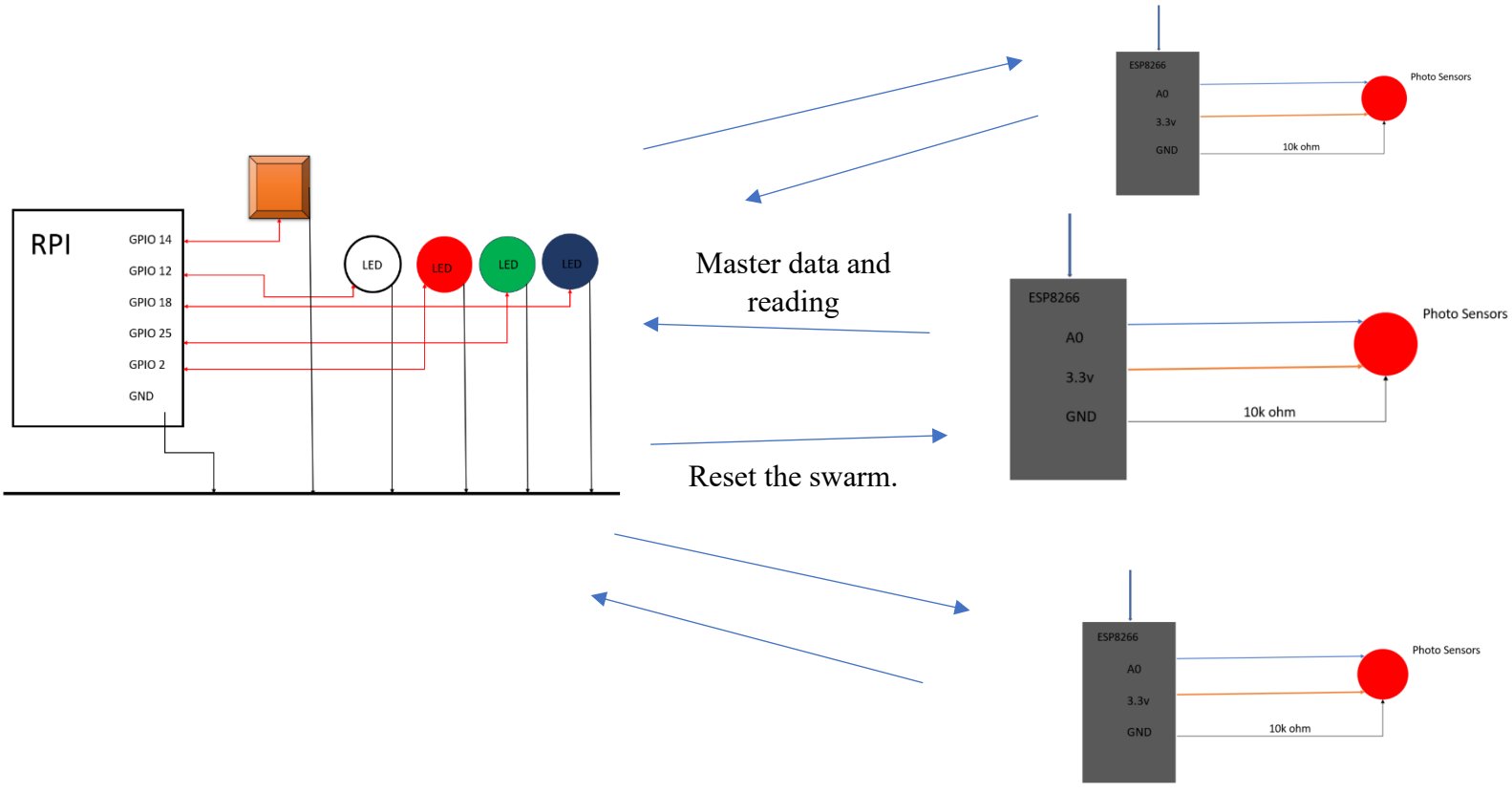


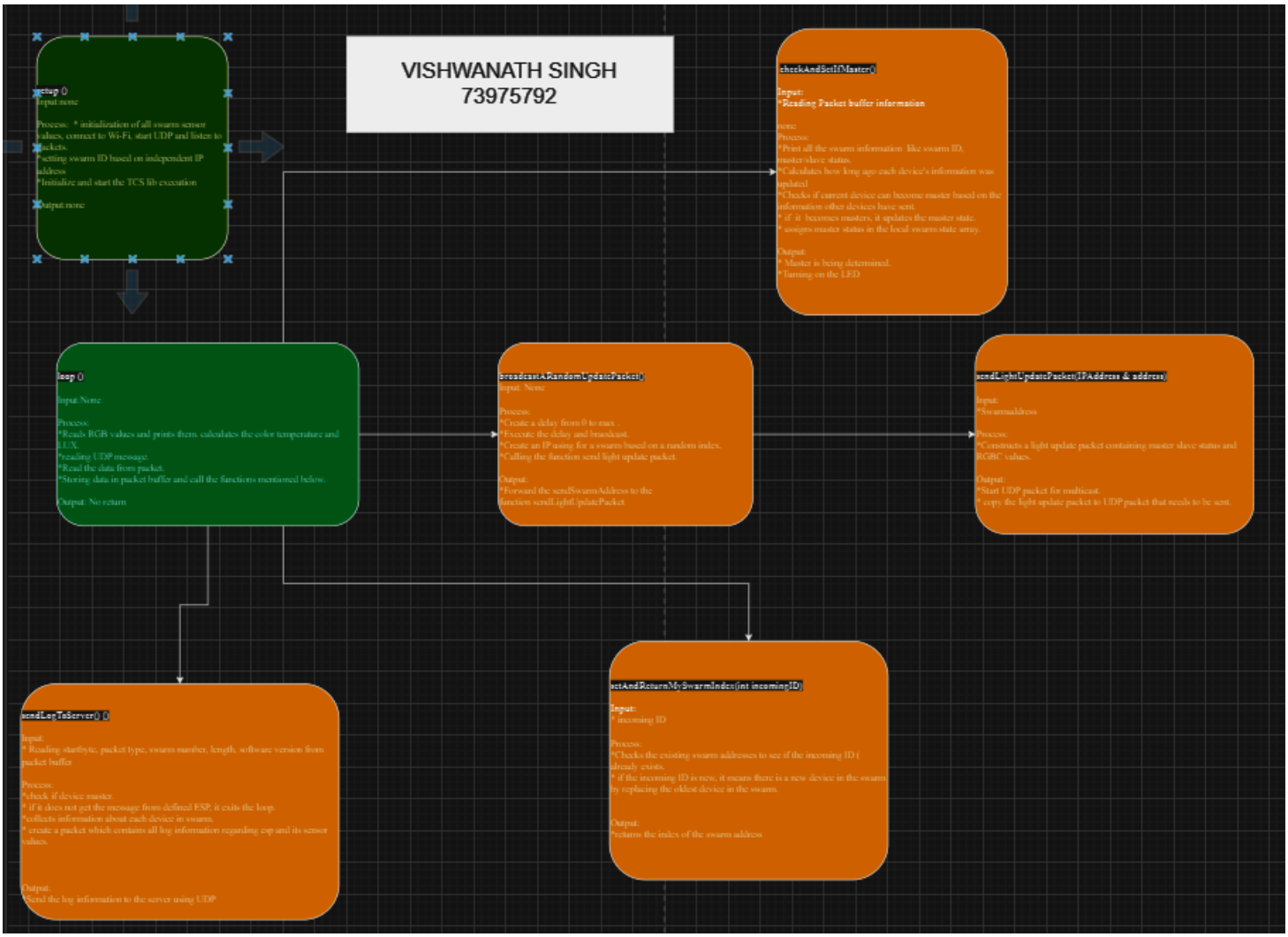
Figure 2: the flowchart containing all the input, process, and the output of all the functions.

Diagram for communication between raspberry pi and ESP



CODE FOR ESP:

These devices communicate through UDP packets, sharing details such as state, software version, and light sensor readings. Each device is assigned a unique ID and can function as either a master or a slave. The system employs a dynamic adjustment mechanism to determine the master device based on real-time information from all connected devices. Notably, when a device operates as the master, the code enables the transmission of log data to a pre-defined server, allowing for centralized monitoring and analysis of the entire IoT network.



videoFigure 3: flowchart for ESP as submitted in Small assignment -5

video: https://drive.google.com/drive/folders/1CFN_ujnFQ-fjjO6suPZx08Rv32Uys3Hk?usp=sharing