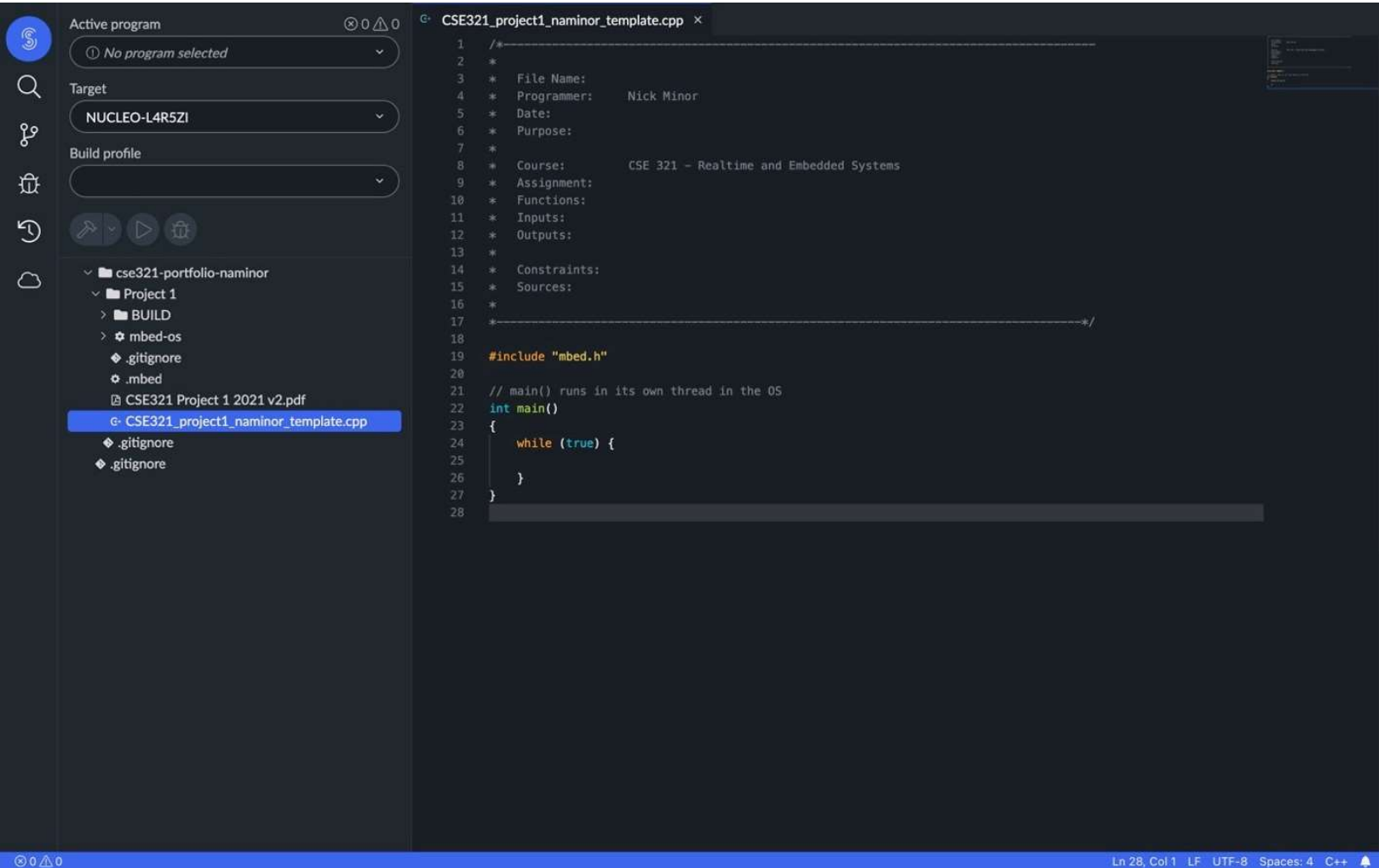


## Part 3

---

### Mbed Studio File Tree and Code Template



## Part 4

---

Github: naminor

## Part 5

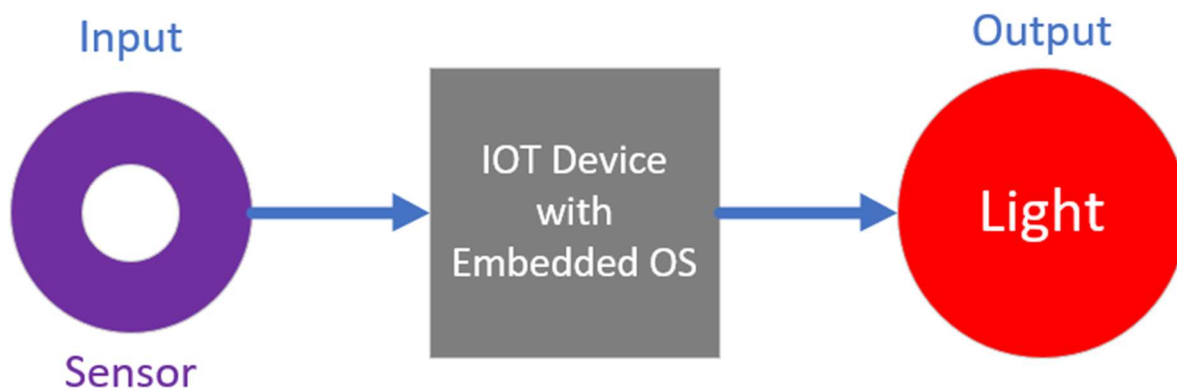
---

### Step 1 - Ask

The purpose of the IOT device is to direct traffic in a way such that the geese are protected from harm. Either no geese are present, and traffic is flowing, or geese are present, and traffic is not flowing. This will be accomplished using sensors for detecting traffic and geese, a traffic light, and an embedded OS running on the IOT device.

**Inputs:** Sensors for detecting traffic and geese.

**Outputs:** Traffic light → Blinks red when traffic can flow, solid red when traffic must stop.



### Step 2 - Research and Imagine

**Where can the light be placed such that all directions of traffic can see it?**

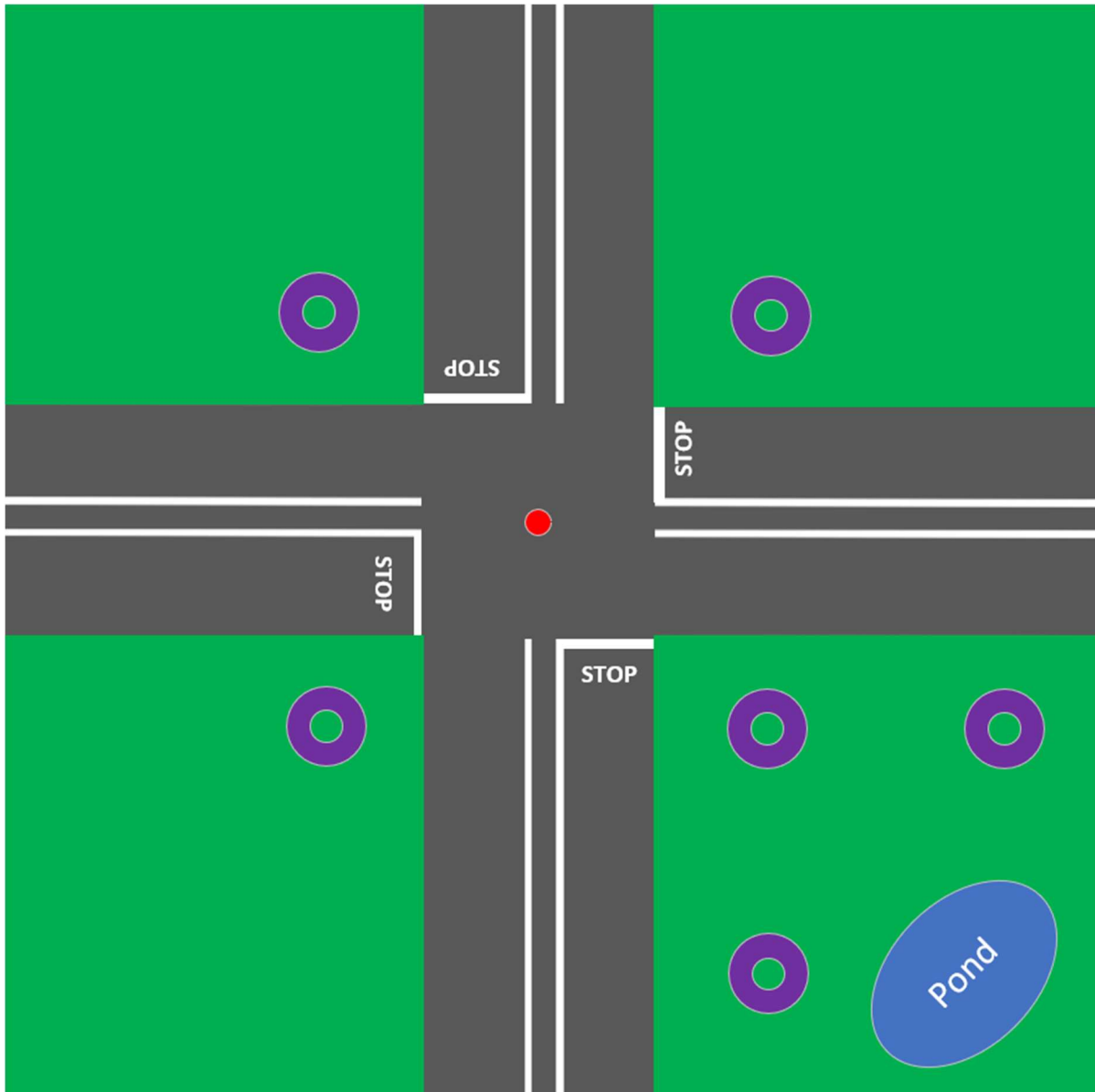
→ If the light is hung over the road, it will be noticeable from all directions.

**Where should the sensors be placed?**

→ The sensors should be placed far enough away so the light has enough time to turn solid red and stop traffic before the geese get to the road. Since traffic is already moving very slowly because of the blinking light, sensors can be placed along a perimeter 15 feet away from the road.

→ If there is a nearby area where the geese tend to congregate, such as a pond, there should be sensors focused on the path between that area and the road.

→A sensor should be placed by the light to see if there are geese currently crossing. This will let the device know that the geese have finished passing through the area and traffic can flow again.



*A possible configuration of the lights and sensors. The red circle indicates the traffic light, and the purple rings show locations of the sensors.*

### Step 3 – Planning

The embedded OS on the IOT device will need to be programmed so that the light is blinking red in its default state. A variable is needed to track if the light is allowed to blink, as well as a while loop with a condition checking if the variable is true. If the condition is true, the condition will turn the light off and then on again. Since the condition is in a while loop, the light will blink.

The device will await an interrupt from the sensors which is triggered upon any geese approaching the road, whereupon it will make the light will turn solid red. This is done by setting the variable to false, so the condition within the while loop doesn't execute. Since the previous execution of the conditional (when the variable was true) ended by turning the light on, the light will remain on while the condition is false.

Once the geese leave, the conditional should be reset to true to allow blinking to resume, and traffic to flow again.

Sensors should be placed in their optimal locations and wired as an input to the IOT device. The light is to be hung over the road and attached as an output to the device.

After every component is physically in place and the embedded OS is programmed properly, the system should be tested to assure that the goal of protecting the geese is accomplished.

