# Week 11 Progress Report

# Name: Paul Westman

# Project: Bee Tracker

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# This past weekend was the open house at Humber and I demonstrated the functionality of the counting mechanism in the hive. I had two GP1A57HRJ00F IR Optical Interrupter Modules mounted on a breakout board on either side of a gate that was cut from acrylic in the Humber Prototype lab. The open house gave me an opportunity to show how I plan to keep a count of the number of bees in the hive at any time. This was done by running a python script to check in which order the IR sensors detected an obstruction. Depending which sensor sent a low signal to the Raspberry Pi first, I was able to determine whether the object was entering or leaving the hive and increment or decrement the counter as necessary.

# I ran into some problems with the positioning of the sensors as it did not detect the pencil like object in the correct sequence when it was entering or leaving. I will have to make some adjustments to the placement of the sensors over the gate to ensure that when a bee enters or leaves, it is sure to obstruct the IR beam and therefore increment or decrement the counter as required. About halfway through the open house, I began demonstrating the functionality of the circuit using a small piece of cardboard that worked much more effectively than the pen, as it obstructed the sensors more consistently. I will have to do more testing using small plastic bees to ensure that the positioning of the sensors over the gate is ideal for sensing the movement of the bees.

# The project has ended up being slightly over budget as I had to purchase sensors that were more expensive than I had anticipated. Due to the time it would have taken to get the IR sensors shipped, I was forced to spend extra in order to get the sensors I needed in time to stay on schedule for the project. The GP1A57HRJ00F IR Optical Interrupter Modules cost around $7 each versus $0.50 that was originally budgeted when I thought that I could order them in bulk from overseas. This is a significant price increase, however the sensors seem to work very well and do exactly what I expect and want them to do.

# After testing my setup and demonstrating at the open house, there are a few problems that I still have to solve. I only demonstrated the functionality of one gate at the open house but in reality will be implementing 5. This means that I have to figure out how to keep a single counter for 10 different GPIO pins that are receiving signals from the IR sensors. Another issue I will have to figure out is how to handle multiple bees trying to enter/leave at the same time. I believe both of these issues will be able to be solved through software.

# I wrote a python script to count the number of bees entering and leaving depending on the order of the sensors that detected an obstruction. The python code I am running is also posted on my GitHub page.