**Group 13**

**Engineering journal assignment 1.**

**Goal:**

Our goal for this challenge was to write a program to get our robot through the ‘labyrinth’ maze. The robot needed to navigate the labyrinth and arrive at the predetermined destination without touching the black lines.

**Programs:**

Before the lab we experimented separately with the robot in the virtual world. We wrote 2 basic programs between us before coming to the lab. The first program was very basic with the robot just moving forward and turning for a set time. The plan was to change the wait1Msec() wait times to work correctly with the physical labyrinth. After getting this code to work for the challenge we realised that this approach was very inefficient as we would be unable to reuse the code again. We decided to alter our more complex program (outlined below) using functions so that we could use parts of the code (the turning and moving forward functions) in future programs.

The second program was slightly more complex. We used the motor synchronisation feature and utilised the encoders to get the robot to travel for a set distance rather than for a set time. While we were in the lab we realised after a long frustrating hour that the motor synchronisation functions didn’t work with the EV3, they were designed for the NXT. The encoders however would work and we took measurements to ensure we could use those functions later on if we had the time.

**Learned:**

We learned that the virtual world is quite inaccurate, our robot had more lego pieces and motors on it than the one in the virtual world (which would have contributed), the robot in the virtual world travelled much farther same amount of time. The friction from the table and the caster wheel getting slowed by the holes in the table may have been largely to blame.

**Finished code:**

In the end we changed the more complex code to make use of functions to move and turn so that we could reuse it in the future. We figured out the diameter of the wheel and used that to (accurately) estimate the distance a 360 degrees rotation of the wheel would make the robot travel.

**Work distribution:**

We distributed the workload evenly in the challenge. We all contributed to the code and each of us wrote different parts of this journal, according to who spent the most time on each section of the challenge.