ELEC143 Robot Programming Task –

Group Project –

Thomas Smale SN: 10533488 Andrew Field SN: 10615762

BASIC TASK (50%) The buggy shall drive around the cones in a clockwise circuit as depicted in Figure 1. This shall be a sequence of straight lines and angled turns. The buggy should end up approximately where it started and facing in the original direction (as if ready to start again). No speed control is required (no need to use the hall-effect inputs) Draw a flow chart for the program IF this is your final and best solution.

* We successfully got the buggy to move into a straight line and around the cones without using the sensors.
* We had initially programmed it with basic maths calculations to work out the distance the buggy would travel, per revolution of the wheel turn and the angles the buggy needed to turn at on the spot.
* The buggy travelled at the same speed throughout the process.

ENHANCEMENT 1: MEASURING DISTANCE (+15%) You can score an additional 15% with the following improvements. Use the hall-effect inputs (see Appendix) from one of the wheels to determine approximately how far the buggy has moved. Used the measured distance travelled to determine (i) when to stop and make the corner turns and (ii) make an accurate angled turn. If this is your final and best solution, comment your code fully, draw and label a flow chart to explain your algorithm and briefly show any calculations used.

* We managed to get the buggy to move into a straight line and around the cones using the sensors.
* We used the measured distance of one hall-effect sensor to determine the points where the buggy needed to stop and make the corner turns.
* It can also make an accurate angled turn.

ENHANCEMENT 2: MEASURING and CONTROLLING SPEED (+15%) You can score an additional 15% with the following improvements. On the straight sections of the course, both wheel speeds shall be estimated via the Hall-Effect inputs, and the speed adjusted continuously to maintain a constant speed of 1 revolution per second. You should control each wheel independently as they will have slightly different characteristics. If this is your final and best solution, comment your code fully, draw and label a flow chart to explain your algorithm and briefly show any calculations used.

* We managed to get the buggy to move into a straight line and around the cones using the sensors at a controlled speed on both motors.
* The buggy travels at one revolution per second using the hall-effect inputs on the straight section of the course.
* Each wheel has its own independent wheel speed characteristic.