**Initio Programming: WS1-4 Sample Answers and Troubleshooting**

**WS1**

**Potential Problems:** Assuming the Initio robot has been correctly constructed and is not broken then there should be no significant problems locating ports and connecting up the robot.

**WS2**

**Sample Answers:** The questions here are all descriptive and should be easy to answer provided the student is watching the robot.

**Potential Problems:**

* Confusion may be caused by students failing to press Return after entering a command.
* Because the robots are tethered to monitor, keyboard and mouse they may not move very steadily.

**WS3**

**Sample Answers:** The questions here are all descriptive and should be easy to answer once the student has correctly understood what to type.

**Potential Problems:**

* Confusion may be caused by students failing to press Return after entering a command.
* Confusion may be caused by the use of argument for *speed* etc. in the commands. This may need to be explained to students.
* Weaker students may not like the open nature of the final question and perhaps will need direction to try out a specific set of commands and see what they do.

**WS4**

**Sample Answers:** The questions here are all descriptive again and the difficulties may lie in understanding how to change the values returned by the various sensors.

**Potential Problems:**

* Objects representing obstacles need to be in front of the actual sensors. So, for instance, the ultrasonic sensor will not detect a small object on the ground in front of the robot. The object needs to be tall enough to reach the height of the sensor.
* See through objects (such as water bottles) may not be picked up by the Infrared sensors which are using light as their detection mechanism.
* The angle at which the sound from the ultrasonic sensors and the light from the infra-red sensors hits an object can cause errors (at some angles the sound/light will bounce away from the robot rather than back towards the robot). This is explored in Ex4-Initio-SensorAngles which suggests experimenting to discover this angle. **IMPORTANT:** This limitation isn’t present in the in the simulator which may cause confusion for some students if they are moving between the two.

**Exercises 4 Sensor Angles**

These exercises take the form of experiments to understand the limitations of the sensors. There may be some logistical difficulties – particularly measuring distances.

For the second exercise (with the infra-red) sensor it is probably better to have an upright flat surface (e.g., a book) placed in front of the robot that can be rotated through an angle, rather than trying to rotate the robot in relation to some object.



University of Liverpool, 2019

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