**Pi2Go Programming: WS1-4 Sample Answers and Troubleshooting**

**WS1**

**Potential Problems:** Assuming the Pi2Go 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.
* Watch out for the difference between lower case and upper case letter Ls in setAllLEDs
* 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 really small object (such as a pencil) 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-Pi2Go-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

This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).