**Worksheet 2: Proximity Sensors & More**

Proximity Sensor Part 1

In the previous activity you made the tortoise do different things, e.g. move forwards or backwards, stop still etc. based on the value of a touch sensor. Now unplug your touch sensor and plug in a proximity sensor. Can you get the tortoise moving in the same way as before? Note:

* Proximity sensors are a different **sensor type** to the touch ones, can you see where the code might need changing to reflect this? Check the function reference sheet for help. Think about changing variable names so that they still make sense.
* Proximity sensors plug into a **different part of the circuit board** but again each socket is numbered and these numbers represent the sensor **position** you need to use when coding.

Proximity Sensor Part 2

Now add another proximity sensor onto the tortoise so you have one on the front and one on the back. Now you have two sensors to check rather than just one, for example you need to tell your tortoise what to do **if** the front sensor is **on and** the back sensor is **off.** Before writing your code it can be helpful to use a logic table to help think about what behaviour you would like:

|  |  |  |
| --- | --- | --- |
|  | **Back Sensor** | |
| **Front Sensor** | 0 | 1 |
| 0 | If both sensors are off… | If the back is on and front is off… |
| 1 | If the front is on and back is off… | If both sensors are on… |

1. Can you write code for a lazy, shy tortoise that stands still until you get too close to his sensors when he moves away? For example if the front sensor is activated he should move backwards.
2. Now can you make an attention seeking tortoise that instead moves towards you when you get close to his sensors?

How do the proximity sensors compare to the touch sensors? Which do you think is better? What are the pros and cons of each? If you wanted to use sensors to stop the tortoise bumping into things, do you think it would be better to use touch or proximity?

Wall Following Behaviour

Can you make your tortoise move around the demonstration arena, staying close to the walls without hitting them? You need to think about:

* Which are the best sensors to use and where do you want to put them on the tortoise?
* How do you want the tortoise to move when the sensors are activated? Perhaps you want to use some **turning** behaviours? Check what functions are available using the function reference sheet.