

1001ICT Introduction To Programming 1 2013-2

Laboratory 3

School of Information and Communication Technology
Griffith University

August 8, 2013

<i>When</i>	Teaching week 4
<i>Goals</i>	In this laboratory you will create MaSH programs for a robot using procedures.
<i>Marks</i>	3
<i>Robot</i>	CalibotNXT2
<i>Track</i>	WhiteBlack Track

1 Preparation

Before your lab class:

- Print these lab notes. You need to refer to them *a lot* before the lab class and during it.
- Review the lecture notes on compiling and running MaSH programs for the NXT.
- You can experiment and create the programs before your class.

2 Pre-laboratory questions (0.5 marks)

Complete the following sentences in the space provided, *before your laboratory class*.

1. Which port is the motor plugged in to on the CalibotNXT2 robot? _____
2. Which port is the touch sensor plugged into? _____
3. Which port is the light sensor plugged into? _____
4. Which port is the rotation sensor plugged into? _____
5. What procedure from the `nxt` environment must be called for each sensor before you can use any other method that uses that sensor? _____
6. Which is the one kind of sensor for which that procedure does not have to be called first?

7. What procedure do you call to make a program wait for a fixed time? _____
8. What is the diameter of the wheels on this robot? (Hint: look at all the photos.) _____
9. What is the circumference of the wheels on this robot?

10. How many counts does the rotation sensor register for one full rotation? _____
 11. How many counts will the rotation sensor need to register for the robot to travel 1 metre?
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3 Activities

3.1 NXT program 1 (1 mark)

- Write a program that drives the robot forwards until the touch sensor is pressed.
- At the top of this program, write a header comment like this (using your own name, and whatever you called your program):

```
/*  
** file:    Push.mash  
** author:  Andrew Rock  
** purpose: Drive a Calibot forward until a touch sensor is pushed.  
*/
```

3.2 NXT program 2 (0.5 marks)

- Write a program that drives the robot forwards and stops it after it has travelled exactly one metre.

3.3 NXT program 3 (1 mark)

- This problem will be revealed during the laboratory class.
- This program, like all your programs, should have a header comment, similar to that requested for program 1.
- Important: When using most sensors, it is usually a good idea to have the robot wait for half a second, between setting up the sensors and using them. This allows the sensor to stabilise.

4 After the Laboratory

- Organize the work you have done into folders on your network drive.