1001ICT Introduction To Programming 2015-2
Laboratory 3

School of Information and Communication Technology
Griffith University

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

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):

```c
/*
 ** 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
- Organise the work you have done into folders on your network drive.
- Please answer these feedback questions.
  - What was the most difficult aspect of this laboratory?
  - Did you find an error in these lab notes?