

LSP 350: Computers & Society

Lecture Notes

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Overview

- Announcements
- Review
- More on NQC
- Downloading Programs to the Robots

Announcements

- Blackboard
- Convocation next week @ 11am
- Online help & manuals
- Reading and homework

Review

Last time:

- What is a computer?
- Overview of Lego Mindstorm Robot
- Introduction to NQC

Programming

Recall that:

- The general process is:

You write a program that looks like English (with lots of rules)	⇒ “compiling”	Gives a binary file the computer can understand	⇒	You “run” the binary to execute the program
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- A **program** is a set of instructions for the computer to follow.
- Programs implement **algorithms**— step-by-step directions for performing a task.

A Simple Program

```
// tankbot1.nqc - drive straight ahead
```

```
#define LEFT OUT_A
```

```
#define RIGHT OUT_C
```

```
task main()
```

```
{
```

```
    On(LEFT+RIGHT);
```

```
    until(false);
```

```
}
```

Some Useful NQC Commands

Command	Definition	Example
<code>On(<i>outputs</i>)</code>	turn on outputs	<code>On(LEFT+RIGHT);</code>
<code>Off(<i>outputs</i>)</code>	turn off outputs	<code>Off(LEFT+RIGHT);</code>
<code>Fwd(<i>outputs</i>)</code>	sets to forward direction	<code>Fwd(LEFT);</code>
<code>Rev(<i>outputs</i>)</code>	sets to reverse direction	<code>Rev(RIGHT);</code>
<code>Wait(<i>time</i>)</code>	wait for time $\frac{\text{time}}{100}$ seconds	<code>Wait(100);</code>

Now what?

Once you've written a program, you need to **download** to your robot to run it.

The basic steps are:

- Type the program on the PC and save as an NQC file.
- Using the I/R tower, download the program from the PC to the robot.
- Run the program on the robot (green button).

First Activity

- **Goal:** To navigate a small obstacle course, making precise turns.
- **Warm-up:** Direct the robot to trace out a square, making 90° turns.
- **Start:** Direct the robot to turn 360° ? Then, 90° ?

NQC Demo

Use NQC to solve the warm-up exercises.

Getting Started with Your Robot

For today's lab, you need:

- an I/R tower (to download programs)
- a robot that can move forward (wheels, legs, treads,...)
- new firmware loaded on the robot

Firmware

- Your robot needs **firmware** specially designed to interpret C/C++/Java programs.
- The first lab has directions on how to download the firmware.
- Once loaded, you can then put your own on the robot.

Today's Lab

Quick overview of Lab 1.