CS 445
Laboratory 6

In this lab, you are going to use Lejos (lay-hoss or lay-joss). As it turns out, the development on Lejos is somewhat inactive so it isn't getting a lot of testing. Some of the procedures they specify don't work all that well under Fedora 3. It appears that the Linux developers are using Debian or Slackware distributions, although they don't say.

There is a nice tutorial at sourceforge and you might want to look at the Java API docs.

In any case, the lejos software has been installed on the systems in EPS 259 in /usr/opt. In there you will find a directory for java, ant and lejos. Do the following (and maybe put them in a bash script file for execution when you want to use Lejos):

- Set JAVA_HOME to /opt/java.
- Set LEJOS_HOME to /opt/lejos.
- Set ANT_HOME to /opt/ant.
- Put $JAVA_HOME/bin in your PATH.
- Put $LEJOS_HOME/bin in your PATH.
- Put $ANT_HOME/bin in your PATH.
- Set your CLASSPATH as follows:

```
export CLASSPATH=$CLASSPATH:.:$LEJOS_HOME/lib/classes.jar:
     $LEJOS_HOME/lib/rcxcomm.jar
```

- Set your LD_LIBRARY_PATH as follows:

```
export LD_LIBRARY_PATH=LEJOS_HOME/bin
```

- Set RCXTTY=/dev/legousbtower0.
- Set RCXTTY=/dev/legousbtower0.

First, you need to download the Lejos firmware. Go to $LEJOS_HOME.bin and download the firmware with:

```
firmdl lejos.srec
```

It should work with the tty option, but the syntax is different than the bricos firmdl3 syntax. One problem is that you can't use the *fast* option with the Linux USB comm device, so downloading is very slow. Bah Humbug!!

Now for a test program. Under $LEJOS_HOME, there is an examples directory. Copy *test/hworld/HelloWorld.java* from the examples directory into your own directory tree. Then do the following:

- Compile it with *lejosjc HelloWorld.java*
- Link it statically with *lejoslink -o HelloWorld.bin HelloWorld*
- Download it with *lejosdl HelloWorld.bin*
- Run it as always with the *Run* button.
- Be thoroughly impressed.

For next week, write a simple line follower using Lejos and turn it in.

Installing Lejos Yourself

There are problems using the stable release on the Lejos Project Page with Java 1.5 and it doesn't support the native legousbtower device. So you can get it to compile by following the instructions in the Lejos FAQ, but it doesn't seem to work with the Fedora driver. Lejos does contain its own driver which you are welcome to try, but I didn't. Instead, I used Java 1.5 and downloaded the CVS copy of the current Lejos. To do this, first create a lejos directory where you want the distribution to reside, and then enter the following command (assuming you have CVS installed):

```
cvs  -d:pserver:anonymous@cvs.sourceforge.net:/cvsroot/lejos co lejos
```

This will download the lejos files. To make the distribution, you have to:

- install Java and ant. You can get Java from Sun and ant from Apache.
- Put JAVA_HOME/bin and ANT_HOME/bin in your path.

Then go into the Lejos directory and enter *make*. It should build everything except the tools. The compiled tools are already in the bin directory, but it would be nice to be able to recompile them.

Notes

If you are installing the stable release with Java 1.5, there are a couple of things you need to do:

In $LEJOS_HOME/Makefile and in $LEJOS_HOME/rcxcomm/rcxclasses/Makefile, add the option *-source 1.2* to the javac command. This will allow it to work with java 1.5.

In $LEJOS_HOME/vmsrc/threads.c there is an error on line 326 using gcc-3.4.2. The code looks like this:

```
            }
done_pi:
#endif // PI_AVOIDANCE

             }
             break;
```

Move the label below the closing brace like this:

```
            }
#endif // PI_AVOIDANCE

             }
done_pi:
             break;
```

and it will compile.

After the install, check to see if there are any strange links to java binaries in /usr/bin. Some (including Fedora) have a wierd java implementation by default. Get rid of the links or replace them with links to your Java binaries.