Informal Parallel Programming Course for High School Students, Fall 2007

How to compile and run code… (examples based on HW0)

About the data directory:

The data directory contains multiple directories that contain files of different amounts of data for your projects to operate on. Each subdirectory should have up to three files with the extensions .h, .32b, and .txt. The '.h' files should be the ones you include on the command line with xmtgcc when you compile your code. They tell the compiler what variables to expect to be available when the program is submitted to the FPGA. The '.32b' file is a binary file containing a long sequence of 32bit words for representing the arrays and other data being sent to be processed by your program on the FPGA. Without this file the FPGA will give you a timeout error. The '.txt' file is a text file that you can look at which describes the content of the data formed by the '.h' and '.32b' files. You may use the following examples to compile your code for HW0 if you are having difficulties. If you are getting timeout errors submitting to the FPGA, check to make sure the command is formatted correctly. For future HW assignments you can use these same commands while updating the data directories, files, and code files.

Compile XMTC code:

`#include <xmtc.h>` //**remember to include this in your code when using XMTC specific C functions**

`xmtgcc32` – compiles c code for the XMT FPGA computer. Creates a file with a '.b' extension instead of '.c'

`xmtgcc32 -h` – see help text on command

```
xmtgcc32 exchange1.s.c          (compile simple serial program for the FPGA with no data)
```

(compile parallel or serial program with data -include option, this is the same as #include in code)
(remember to compile your code while in the ***src directory*** if you use the example commands below)

(the following 12 commands can be used to compile any one of the exchange code files with any one of the data sets)

```
xmtgcc32 -include ../data/16/exchange.h exchange.s.c
xmtgcc32 -include ../data/3200/exchange.h exchange.s.c
xmtgcc32 -include ../data/16000/exchange.h exchange.s.c
xmtgcc32 -include ../data/64000/exchange.h exchange.s.c

xmtgcc32 -include ../data/16/exchange.h exchange1.p.c
xmtgcc32 -include ../data/3200/exchange.h exchange1.p.c
xmtgcc32 -include ../data/16000/exchange.h exchange1.p.c
xmtgcc32 -include ../data/64000/exchange.h exchange1.p.c

xmtgcc32 -include ../data/16/exchange.h exchange2.p.c
xmtgcc32 -include ../data/3200/exchange.h exchange2.p.c
xmtgcc32 -include ../data/16000/exchange.h exchange2.p.c
xmtgcc32 -include ../data/64000/exchange.h exchange2.p.c
```

Submit XMTC programs to the FPGA:

`xmtfpga` – submits compiled binary files to run on XMT computer

`xmtfpga -h` – see help text on command

(submit program with project label and binary data file, the –p option is not needed but is helpful)
(remember to run your code while in the ***src directory*** if you use the example commands below)

```
xmtfpga -p hw0 -d ../data/16/exchange.32b exchange.s.b
xmtfpga -p hw0 -d ../data/3200/exchange.32b exchange.s.b
xmtfpga -p hw0 -d ../data/16000/exchange.32b exchange.s.b
xmtfpga -p hw0 -d ../data/64000/exchange.32b exchange.s.b

xmtfpga -p hw0 -d ../data/16/exchange.32b exchange1.p.b
xmtfpga -p hw0 -d ../data/3200/exchange.32b exchange1.p.b
xmtfpga -p hw0 -d ../data/16000/exchange.32b exchange1.p.b
```

```
xmtfpga -p hw0 -d ../data/64000/exchange.32b exchange1.p.b

xmtfpga -p hw0 -d ../data/16/exchange.32b exchange2.p.b
xmtfpga -p hw0 -d ../data/3200/exchange.32b exchange2.p.b
xmtfpga -p hw0 -d ../data/16000/exchange.32b exchange2.p.b
xmtfpga -p hw0 -d ../data/64000/exchange.32b exchange2.p.b
```

Check results of previous submissions:

`xmtfpgadb` – view a database of your previous submissions

`xmtfpgadb -h` – see help text on command

`xmtfpgadb -l -p hw0`	(look at summary of submission results for projects marked 4e)
`xmtfpgadb -g 3`	(retrieve submission 3 output from database)