

## ECGR6185, Spring 2010: Lab 5

### Floating Point Computation

#### Learning Objectives

You are to write a program that runs on your QSK62P board that measures the time that a floating point computation takes, compared to fixed point.

#### Laboratory Assignments

In this lab you will be programming the timers and floating point computations. You will determine how much time fixed point, floating point single precision, and floating point double precision.

Consider the equation:

```
c=a*b/4; // c, b, a are all ints
```

This can be in long integers:

```
c=a*b/4; // c, b, a are all long ints
```

This can be in single precision float:

```
c=a*b/(float) 4.0; // c, b, a are all float
```

This can be in double precision float:

```
c=a*b/(double) 4.0; // c, b, a are all double
```

How much time does each computation take? We discussed in class how you could measure this (i.e. using a timer and examining the timer data registers, wiggling ports and using a scope to identify the start and stop). Perform an analysis on this equation and compare the performance of ints, long ints, floats, and doubles.

Your grade will be determined by how close to the professor's number you come.

#### Requirements

- Req. 1. The code generated is written in C for the QSK62P or QSK62P Plus.
- Req. 2. The code is well commented and easy to follow.
- Req. 3. The code should be as compact as possible.
- Req. 4. Your observations are justified by empirical measurements and procedures of these measurements.

#### Lab Report

Include in your lab report observations and procedure like the following:

*The general learning objectives of this lab were . . .*

*The general steps needed to complete this lab were . . .*

*Some detailed steps to complete this lab were . . . .*

1. *Step one*
2. *Step two*
3. *. . . .*

*Some important observations while completing/testing this lab were . . .  
In this lab we learned . . . .*

Create a single pdf containing:

1. Your lab report
2. Your code (no need to include the sect30.inc, ncr0.a30, LCD, or any .h files). Include all c files that have code that you wrote (but if you are smart, this should be one small file so that the code size is small). Ensure you use an 8 or 9 courier font so that most lines of code take one line of text.
3. The full map file. Ensure you use an 8 or 9 courier font so that most lines take one line of text.

Upload this pdf to moodle. Name the file xxxxxxxx\_yyyyyyy\_lab5.pdf, where xxxxxxxx is the last name of one lab partner, and yyyyyyy is the last name of the other lab partner.

ALSO, upload your C file as a separate file

**FAILURE TO FOLLOW THESE SIMPLE INSTRUCTIONS COULD RESULT IN THE LOSS OF POINTS.**