

# University of North Texas, College of Engineering

## Department of Electrical Engineering

### EENG 3910: Project V - Digital Signal Processing System Design

#### Assignment 6

Lab Session: Monday, 03/21/2016

Due: Monday, 03/28/2016

Student Name: \_\_\_\_\_

#### Important:

- Please create a new assignment folder in your working directory for each assignment, and a new problem folder in the assignment folder for each problem.
- Please backup your files in your own USB drive or your own network drive at the end of each class because the workbench computers may be reimaged without prior notice.

#### Problem 1. Signal pass through from ADC to DAC with triple buffering.

- Create a new CCS project "Lab6\_1". Add the sample code "Lab6\_1\_main.c" to the project.
- Compile, load, and run the project on your LaunchPad.
- The input and output setup of this lab is exactly same as Assignment 5 Problem 1. The input signal is sampled with ADC at PD0 and the output signal is sent to SPI DAC chip through SSI0.
- Explain in your report how the triple-buffering technique works.
- Study the sample code and explain the code line-by-line in your report.

#### Problem 2. Signal pass through from ADC to DAC with Ping-Pong buffering.

- Create a new CCS project "Lab6\_2".
- The input and output setup of this lab is exactly same as Problem 1.
- Use the Ping-Pong buffering technique to implement the same signal pass-through functionality as in Lab6\_1. Triple buffering technique was used in Lab6\_1, which is different from the Ping-Pong buffering. Ping-Pong buffering is explained in class and briefly summarized in the lecture notes.
- Explain in your report how the Ping-Pong buffering technique works.
- Explain your own code in your report.

#### Assignment Deliverables:

- Compile your report with pictures, plots, and the codes that you have written or modified.
- Explain in detail what you have done, why you have done in that way, and what you have learnt. Follow the report format outlined in the Introduction lecture notes.
- Email your report and source codes for grading. For source code submission, you will need to zip your working directory and send the zipped file to your TA.
- Printout of your source code should be attached to your lab report as appendix. If your source code goes beyond two pages, please only print the part of the source code where you have newly written or modified.