

DSP Lab Final Project

- 1) **(10 points) Understanding FFT:** Explain what Fast Fourier Transform (FFT) is and how it works.
- 2) **(10 points) MATLAB Experiment:** Use the speech signal you created in Lab 6 and find its FFT in MATLAB. Plot the signal in the time domain as well as its FFT in the frequency domain. Use appropriate titles and labels.
- 3) **(10 points) C Experiment; Implement FFT in floating-point C:** Use the speech signal you created in Lab 6 and create a C code for finding its FFT.

Note: To test the C code, there are two options: Option 1 is using the Code Composer Studio (which is recommended). Option 2 is using any available standard C compiler. You could use option 2 to test their code at home. You may find this link useful: https://rosettacode.org/wiki/Fast_Fourier_transform#C

- 4) **(10 points) C Experiment; Implement iFFT in floating-point C:** Develop a C code that finds the inverse FFT (iFFT) for the results obtained in part 3.
- 5) **(10 points)** Plot the original speech signal and the obtained results in parts 3 and 4 in MATLAB. Use appropriate legends.
- 6) **(20 points)** Perform the same tasks of parts 2-5 for the impulse response you had in Lab 6.
- 7) **(30 points)** Implement the FFT of the speech signal and the impulse response on the DSP unit and take photos from the results shown on the simulator.
- 8) Write a full report on this project and the results. Include figures with appropriate captions.
- 9) Prepare a set of slides and present it along with a demonstration of the project on **Wednesday, Dec. 7, 8:00 am -10:50 am.**

Good Luck