Task # 10: ADC & DAC Interfacing

MBSD @ DCSE, UET

Assigned by Dr. Bilal Habib

Deadline: 11-7-2021 in class

If submission of any two students looked similar/copied, both will get -10

In this project you are required to interface an ADC and DAC, to 89C51 microcontroller as shown below in figure 1.

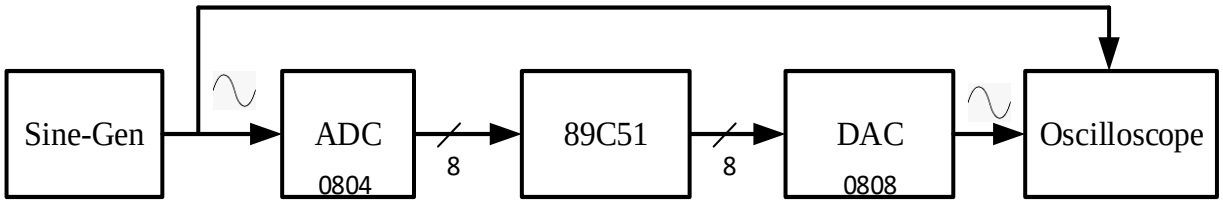

Figure 1: ADC and DAC interfaced to Microcontroller

Combine the ADC and DAC together and show me the demo for grading. No submissions after the deadline will be acceptable. Include the schematic of a circuit in the written report.

Show the original sine wave and the final output of DAC on the oscilloscope as shown in figure 1. If you see any distortions in the DAC output, clean them using filters. Written report must have answers of the questions below,

- Input signal to ADC has a frequency (**f_in)** of 100Hz. How you supplied it.
- What happens if you decrease the sampling rate (**fs**) from 1K, 0.5K to 0.2K samples per second?
- What reference voltage (**V_ref**) has been used for ADC?
- What is the relationship of **V_ref** to the amplitude of input signal.
- What will be the step-size?
- What is the input voltage range of ADC?
- Can we increase the frequency of input signal (**f_in)** to 10KHz, if not then why?
- What is the limit of DAC, how fast it can work?
- Use Low pass RC filter to clean the output of DAC. Find the optimal values of R and C in this filter.