**DSP Lab Assignment 1**

The lab on Digital Signal Processing introduces the student to the various signal processing algorithms that are implemented on the Texas Instruments (TI) TMS320C6713 board containing the C6713 processor. Various features of the board and the processor make it ideally suited for real time processing of signals. Some of the unique features of the board are:

1. Four jacks for Mic-In, Headphone, Line-In and Line-out. These can be used for providing input and taking output from the board.
2. AIC23 Codec: Codec is a device that contains Analog to Digital Converter (ADC) and Digital to Analog Converter (DAC). The analog input signal provided to the board is converted to digital form since the on-board memory of the board is finite. The board uses sigma-delta converter to convert the analog signal to digital form. The sampling frequency can be varied through the code and the board supports sampling frequencies of 8, 16, 24, 44.1, 48 and 96 KHz.
3. The clock frequency of the processor is 225 MHz which translates to a clock cycle of 4.44 ns. During each clock cycle upto eight instructions can be carried out in parallel. The board also has an anti-aliasing filter to nullify the aliasing error.
4. The processor has 256 KB of internal memory and can address 4 GB of external memory.
5. The processor can implement codes written in C language with slight modifications. Code Composer Studio is an integrated development environment containing a C debugger, linker and composer that is used for writing codes to be implemented on the processor.
6. The ADC samples the signal using the stereo mode where sample from each channel is given 16 bits. The samples are combined (first left then right) to construct a 32 bit sample value stored in a Uint32 number.
7. This number is fed to the processor where it is processed based on the signal processing code available on the processor.
8. The algorithm generates a Uint32 output. This output is used to create an analog reconstruction of the processed signal by the DAC. The output can be accessed from any of the output ports.

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