Lab Manual #5

Pulse code Modulation

Objective: Implementing PCM on any analogue signal.

Pulse Code Modulation is a procedure for analogue to digital conversion.

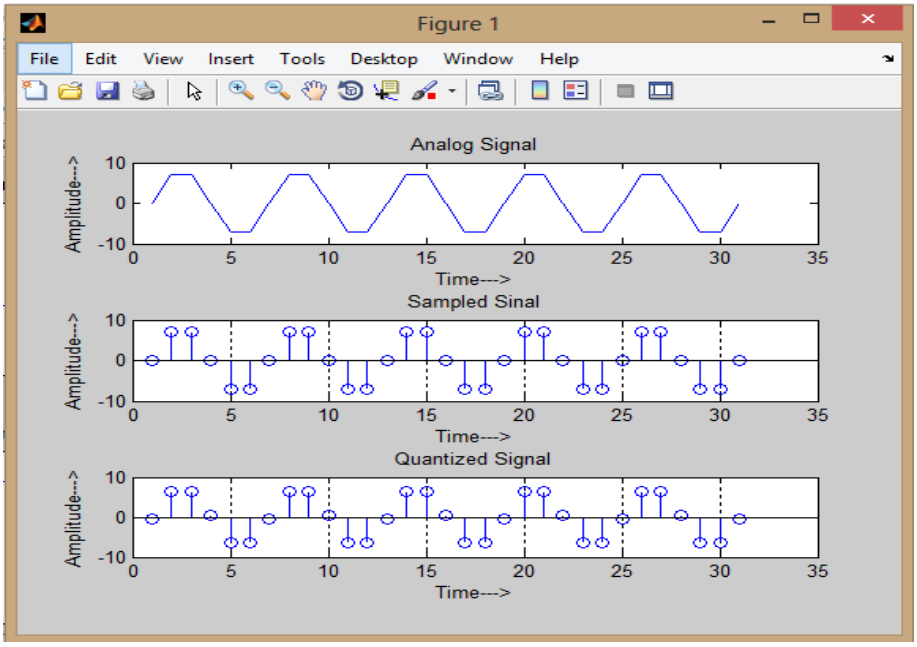
Modulation Steps:

1: Sample the input signal at appropriate sampling rate.

2: Quantize the sampled values and assign binary codes for each quantization Level, say if we are using 8 levels we will be using 3 bit codes and assigning 3 bits per data value. For sampling rate 10 samples/sec it will make our bit rate 10x3=30 bit/second.

3:Now using any line encoding technique convert this binary data to continues pulse for transmission.

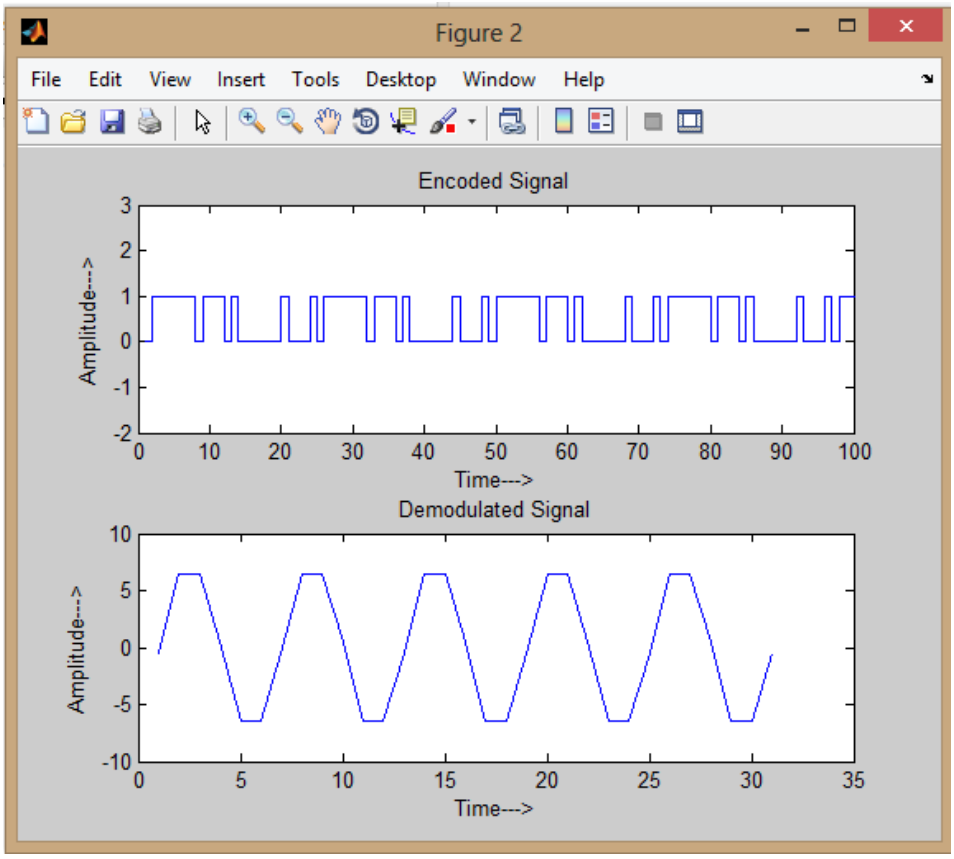
Expected Output is:



Demodulation Steps:

1. Detect the binary values from the pulse you received.
2. Reassign discrete data values to the binary codes using codebook.

3. Regenerate the wave using plot.



TASKS :

1) Take a sinusoidal signal and perform following:
   1. Apply PCM and display the results.
   2. Add noise of variance 0.5, 1 and 10.
   3. Demodulate (Upto Quantized Signal) the waves received by channels of three different noises and display the results.
2) Calculate 3 different Bit Error rates of received bit streams (by channels of three different noises) with transmitted bit stream.