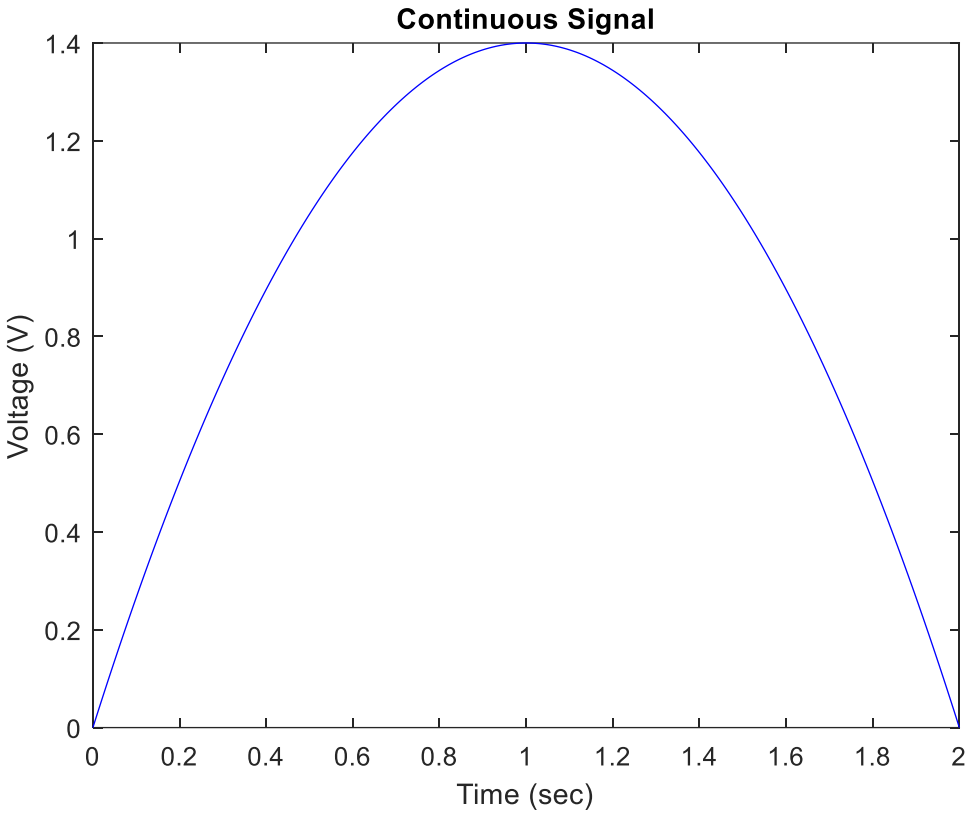
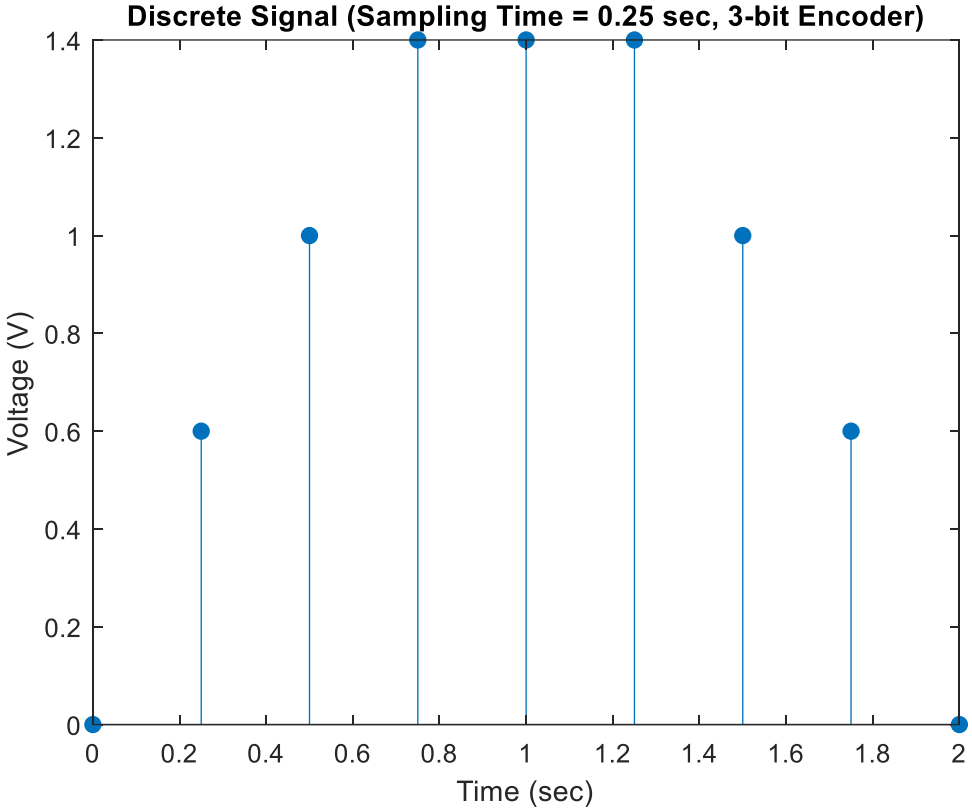
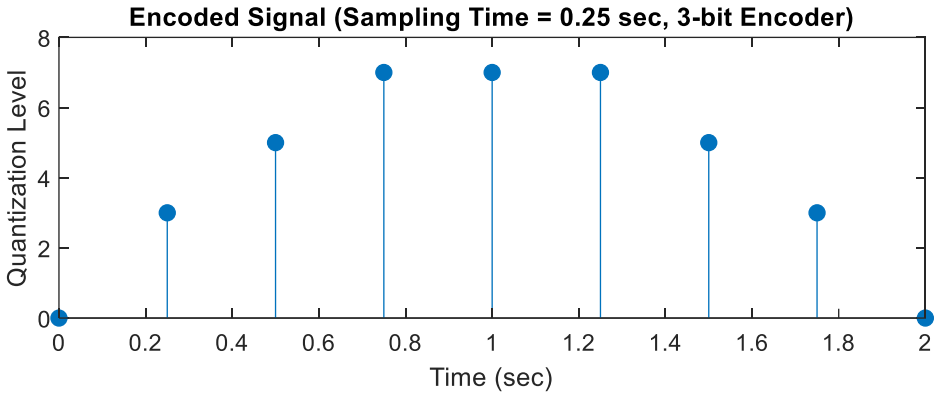
Original Signal:



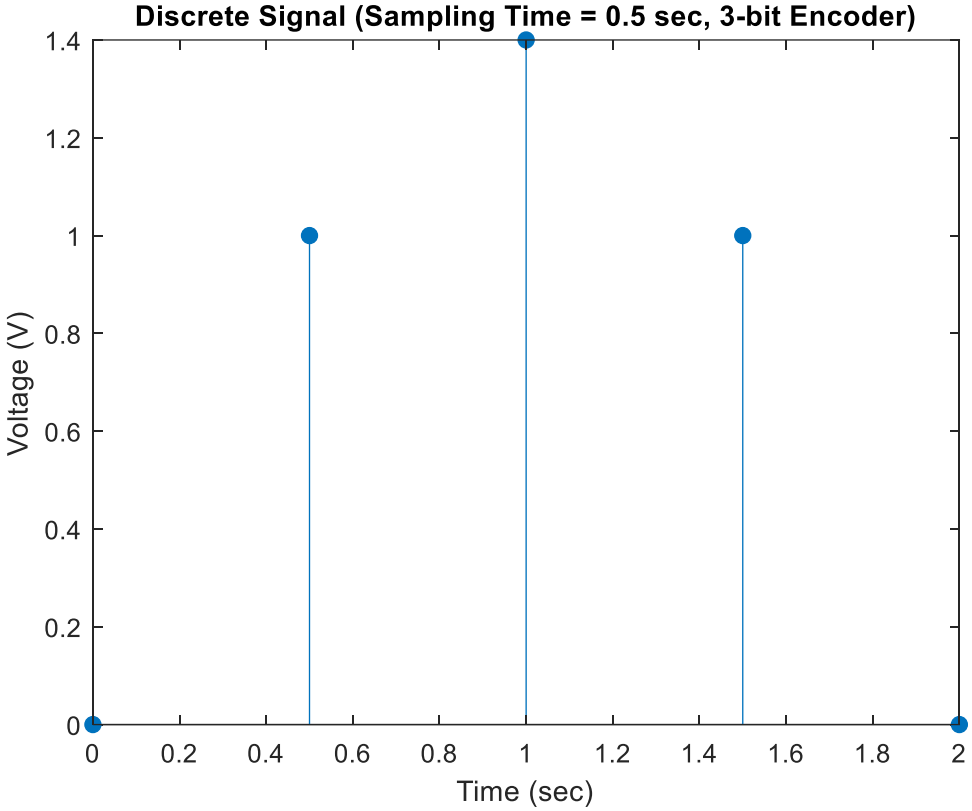
Ts = 0.25, 3-bit encoding:

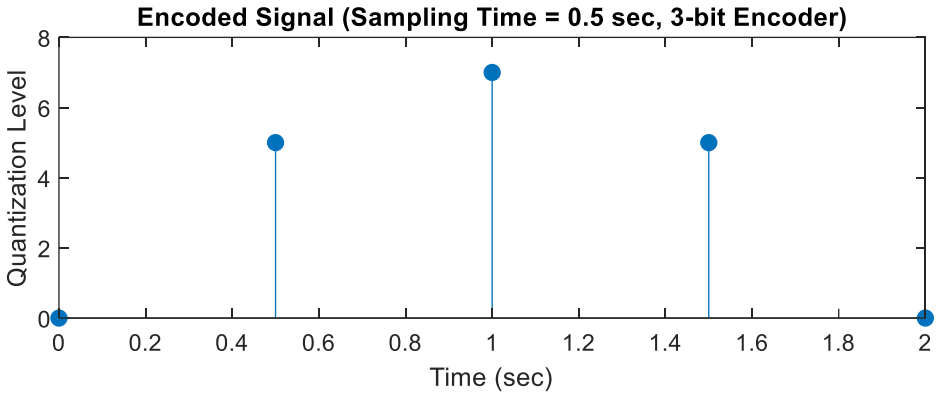




Sequence = [000, 011, 101, 111, 111, 111, 101, 011, 000]

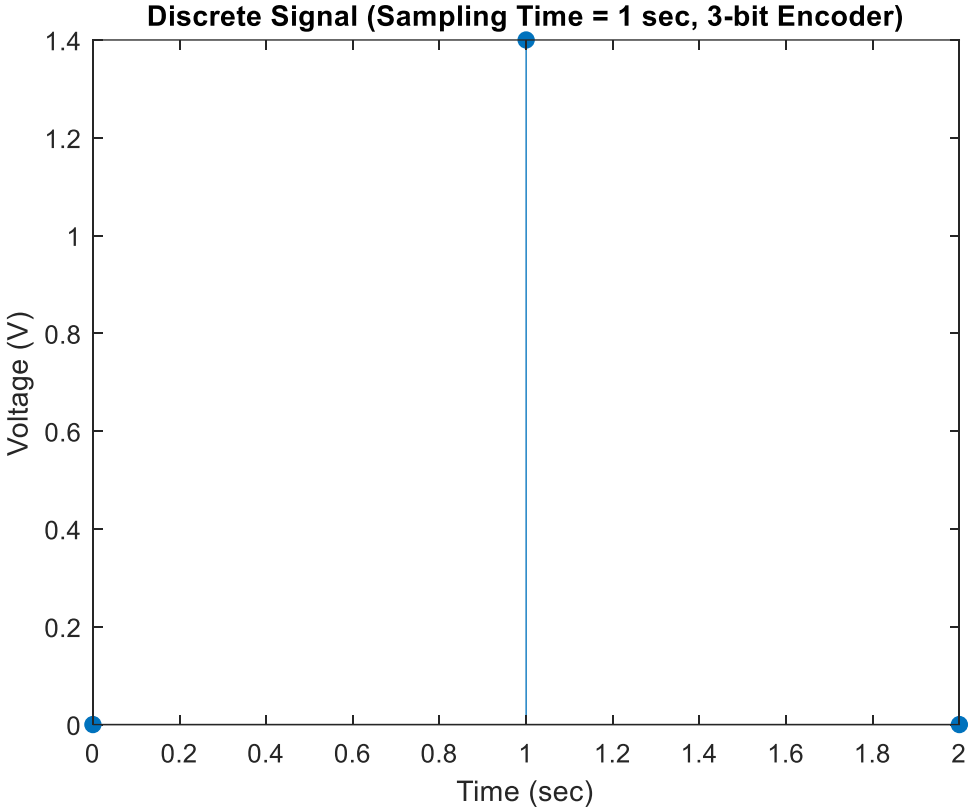
Ts = 0.5, 3-bit encoding:

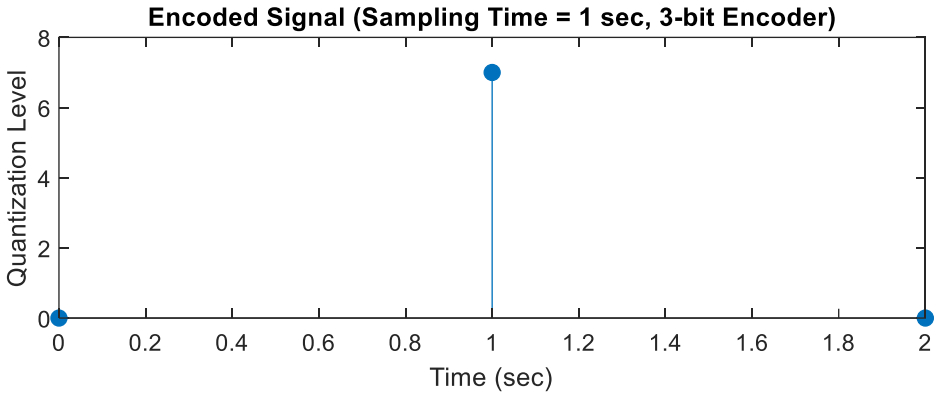




Sequence = [000, 101, 111, 101, 000]

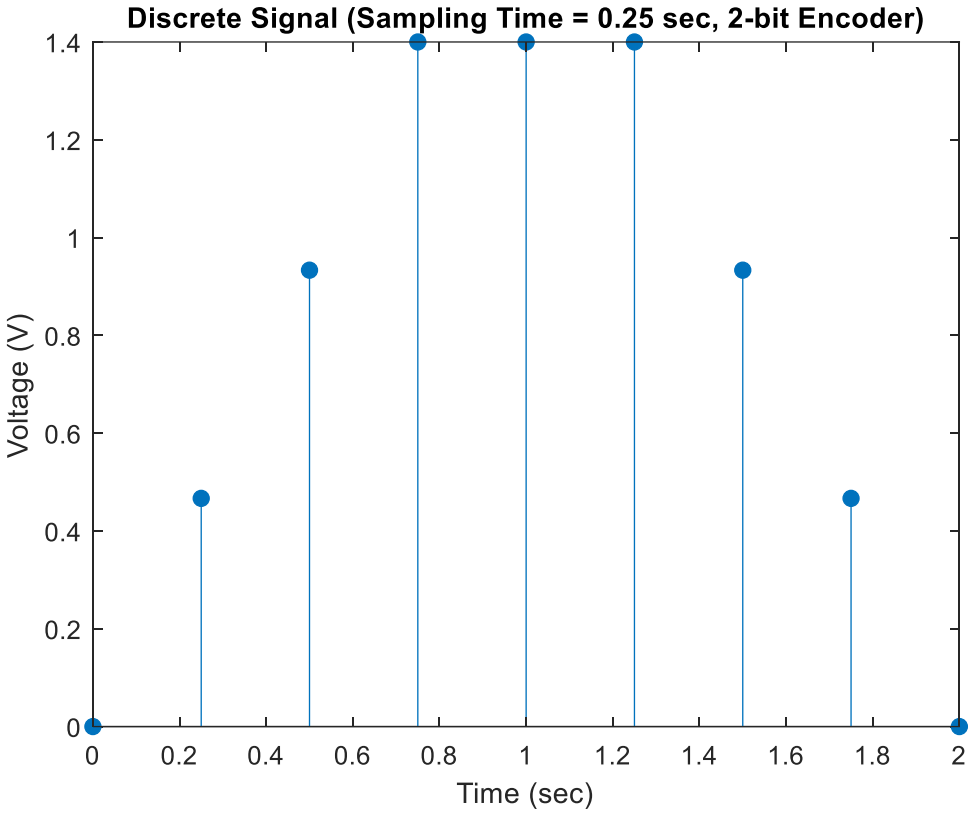
Ts = 1, 3-bit encoder:

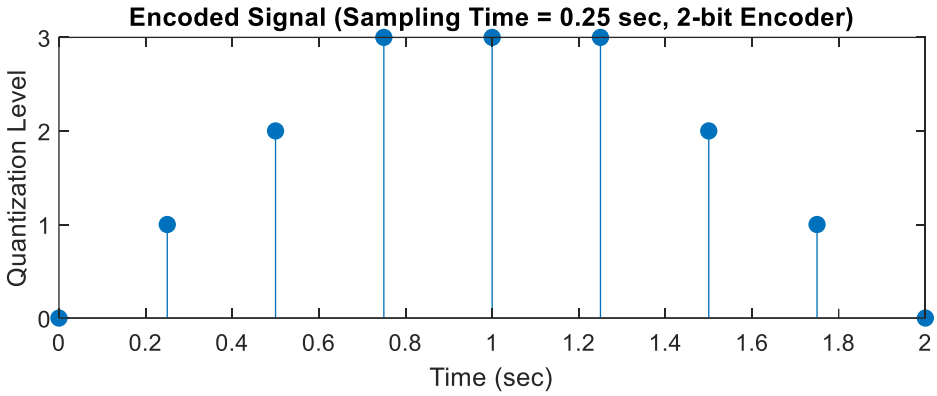




Sequence = [000, 111, 000]

Ts = 0.25, 2-bit encoder:





Sequence = [00, 01, 10, 11, 11, 11, 10, 01, 00]

Conclusion:

Increasing the sampling time reduces the number of samples, which leads to a less accurate representation of the original signal.

Reducing the number of bits in the encoder increases the quantization error (values have to be rounded up or down), resulting in a less precise digital representation.