

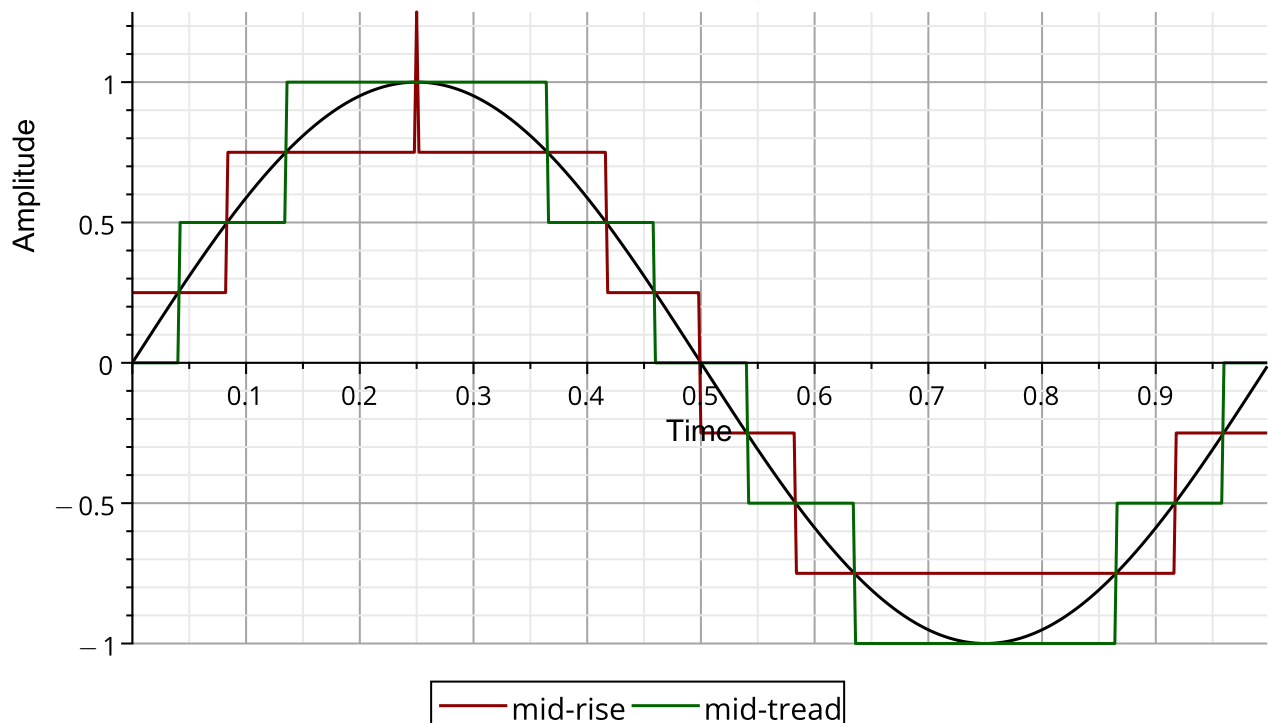
Mid-Rise and Mid-Tread Quantization

This application demonstrates the difference between mid-rise and mid-tread quantization of a signal.

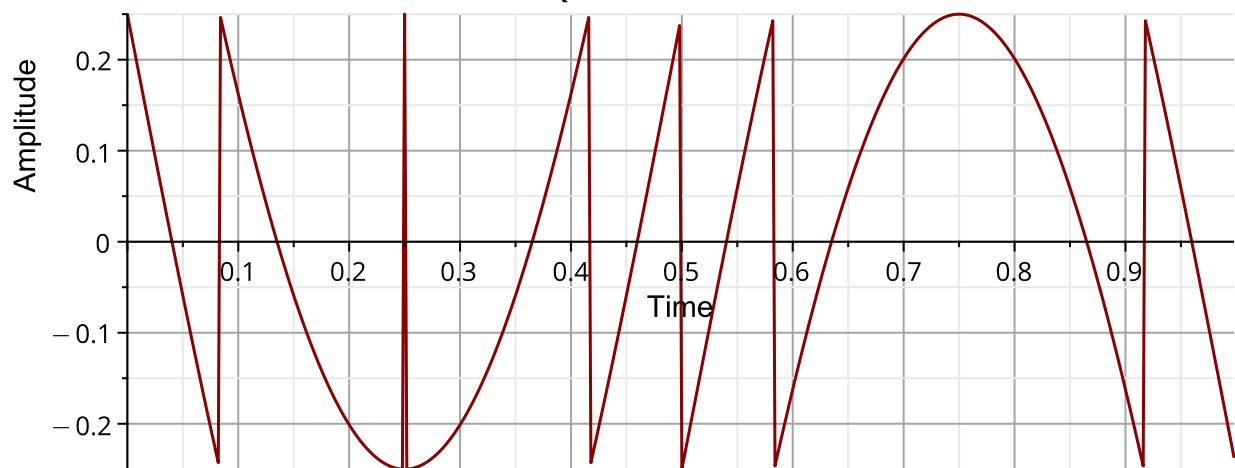
```

Signal frequency      Fs := 500
Number of samples    N := 500
Generate the signal  t := Vector(N, i -> (i - 1) * 1/Fs)  sig := Vector(N, i -> sin(2 * pi * t[i]))
Half-range of signal u := 1
Number of bits       b := 2
Quantization interval Delta := 2 * u / 2^b
Input/output formula Q_midtread := x -> Delta * floor(x / Delta + 1/2)  Q_midrise := x -> Delta * ceil(x / Delta - 1/2)
Quantize the signal  sig_midtread := Q_midtread ~ (sig)  sig_midrise := Q_midrise ~ (sig)
    
```

Mid-Rise and Mid-Tread Quantization



Mid-Rise Quantization Error



Mid-Tread Quantization Error

