```matlab
% exp 4
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% 2020uco1505
b = 3;
N = 150;
n = 0:(N-1);
x = sin(2*pi*n/N);
x(x>=1) = 1;
x(x<-1) = -1;
xq = floor((x+1)*2^(b-1));
xq = xq/(2^(b-1));
x_snr = [ ];
xq = (xq - (2^(b) - 1)/2^(b));
xe = x-xq;
for n = 1 : N
    temp = (x(n).*x(n))./(xe(n).*xe(n));
    x_snr = [x_snr temp];
end
stem(x,'b');
hold on;
stem(xq,'r');
hold on;
stem(xe,'g');
hold on;
stem(x_snr,'k');
legend('exact','quantized','error','Location','Southeast')
title(sprintf('Signal, Quantized signal and Error for %g bits, %g quantization
 levels',b,2^b));
hold off;
```
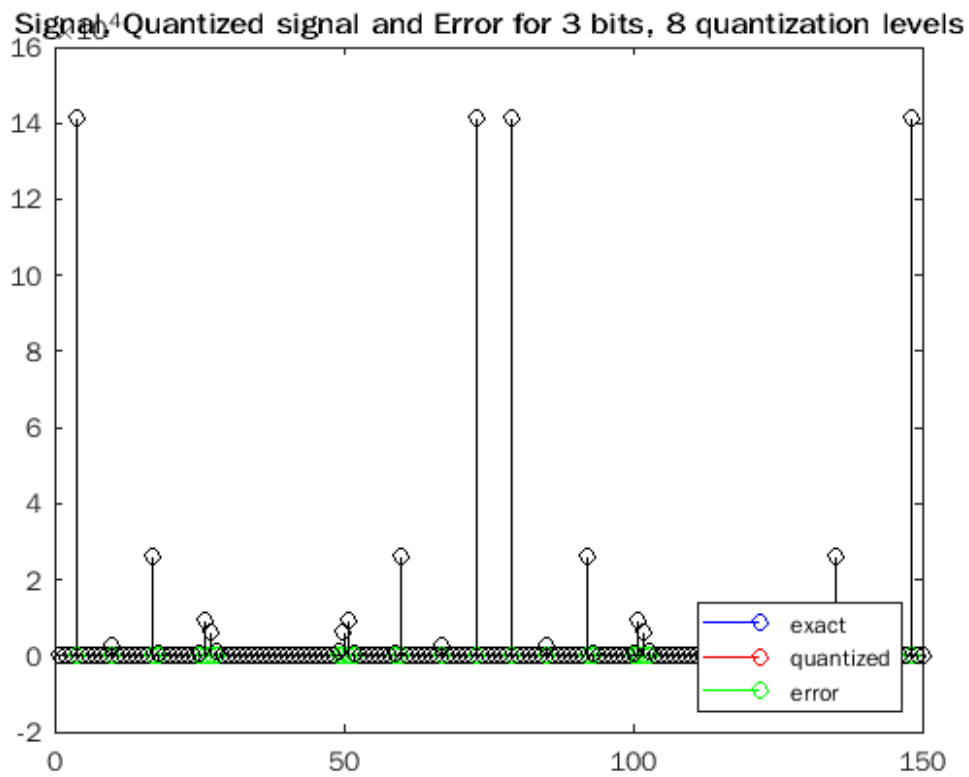
Signal, Quantized signal and Error for 3 bits, 8 quantization levels

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