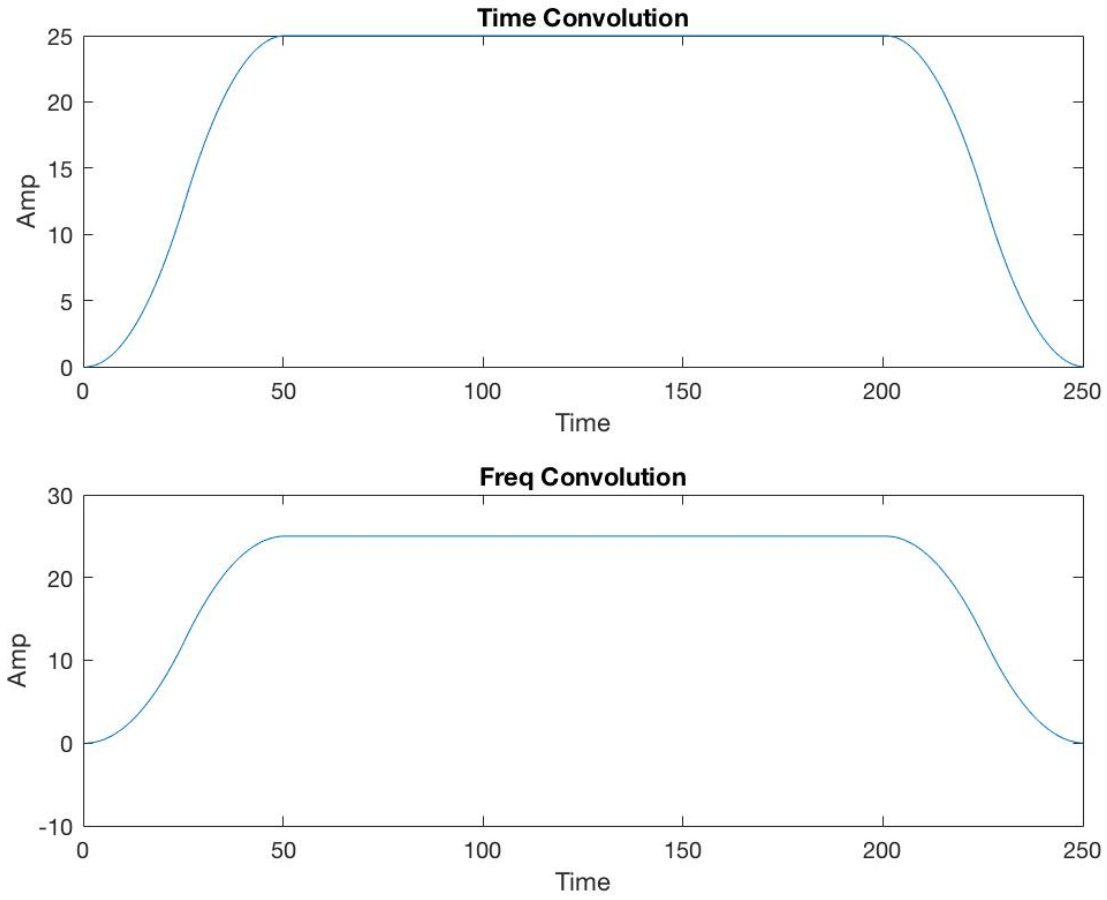
Report_Convolution

Length

the length will be x+y-1;

Figure



Discussion

Methods	Time(s)
Build-in convolution	0.1647
myTimeConvolution	11.1933
myFreqConvolution	0.1134

The most time-efficient method is the frequency convolution method and the least time-efficient method is the time convolution method created by myself. The reason why this happened is because convolution in frequency domain utilze FFT, whose time complexity is o(nlogn) vs. the time complexity of my time convolution is o(n^2) and also faster then build-in convolution. But doing frequency domain convolution can cause a little bitt error, which I think is caused by frequency leakage, but which is neglectable. In addition, there are a lot of if statement in my time convolution which can be obmitted by turn the hole thing into three loops, but this still can't beat the build-in convolution, which I don't know how they immplement it.