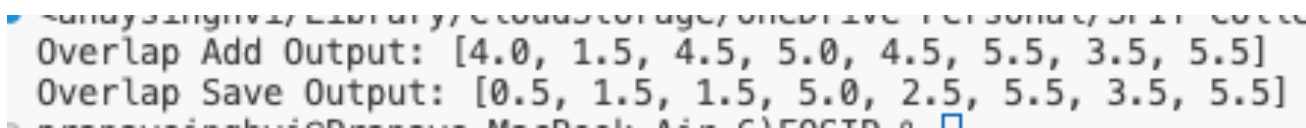


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### Experiment 5

<b>AIM:</b>	To perform filtering of Long Data Sequence using Overlap Add Method and Overlap Save Method.
<b>OBJECTIVE:</b>	To Develop a function to implement Fast Overlap Add Algorithm and Overlap Save Algorithm
<b>PROBLEM DEFINITION:</b>	Take long input sequence $x[n]$ and short length sequence $h[n]$ Find $y[n] = x[n] * h[n]$ using FFT based Overlap Add Algorithm and Overlap Save Algorithm.
<b>INPUT SPECIFICATIONS</b>	1. Length of first Signal $L$ and Signal values 2. Length of impulse response of FIR filter Signal $M$ and Signal values.

### EXPERIMENTATION AND RESULT ANALYSIS

<p>Input: <math>x[n] = \{ 1, 2, 3, 7, 5, 6, 7, 4 \}</math>  <math>h[n] = \{ 0.5, 0.5 \}</math> Length <math>M=3</math>  For <math>N=8</math>, Let <math>L=6</math></p>  <p>The screenshot shows MATLAB code for implementing the Overlap Add and Overlap Save methods. The input signal <math>x[n]</math> is [1, 2, 3, 7, 5, 6, 7, 4] and the impulse response <math>h[n]</math> is [0.5, 0.5]. The code calculates the FFT of the input, applies the impulse response, and then uses the overlap-add and overlap-save techniques to produce the final output. The output for both methods is shown as [4.0, 1.5, 4.5, 5.0, 4.5, 5.5, 3.5, 5.5].</p>
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<p><b>CONCLUSION:</b></p> <ol style="list-style-type: none"> <li>1. The Overlap-Add and Overlap-Save Method is an efficient practical way to evaluate the discrete convolution of long input signal <math>x[n]</math> and finite length signal <math>h[n]</math>.</li> <li>2. The Overlap-Add and Overlap-Save Method can be implemented using FIR filters and can not be implemented using IIR filters.</li> <li>3. The Overlap-Add and Overlap-Save Method is a Block Processing Technique.</li> </ol>
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