Ahsanullah University of Science & Technology

Department of Electrical and Electronic Engineering

Assignment

Course No : EEE 3218

Course Title : Digital Signal Processing Lab

Submission Date : 23-02-2023

Submitted by

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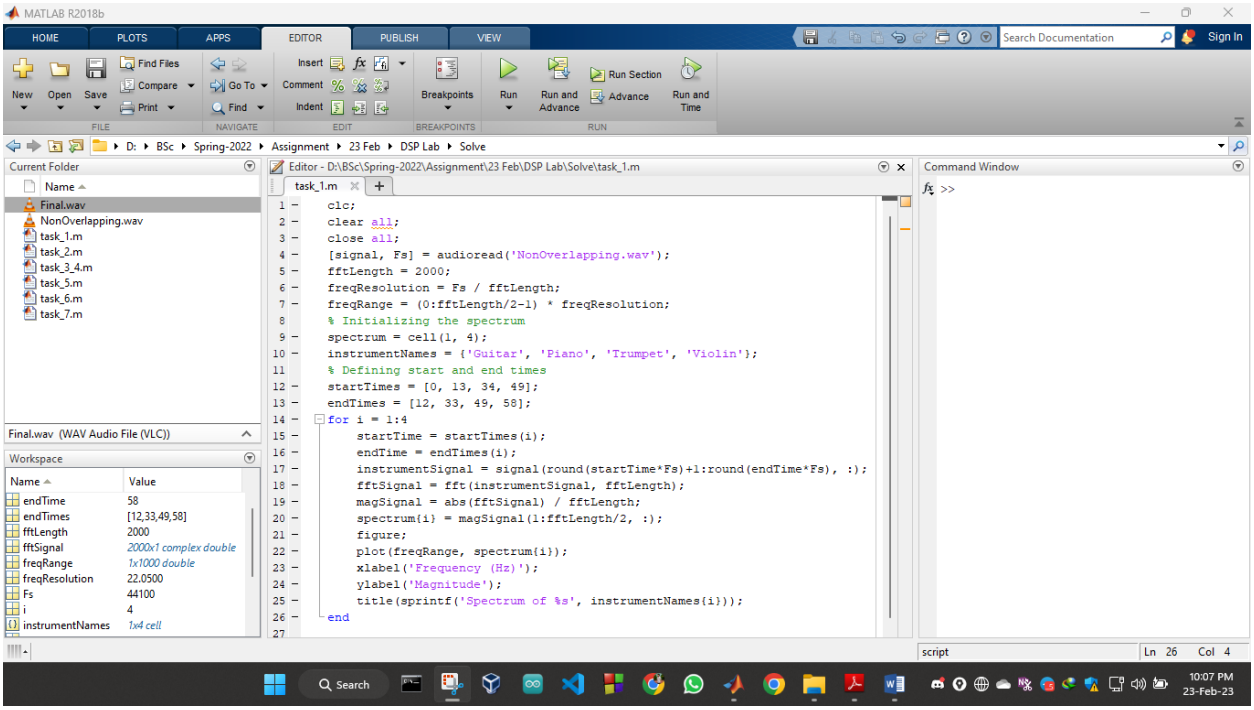
Section : C2

Year : 3rd

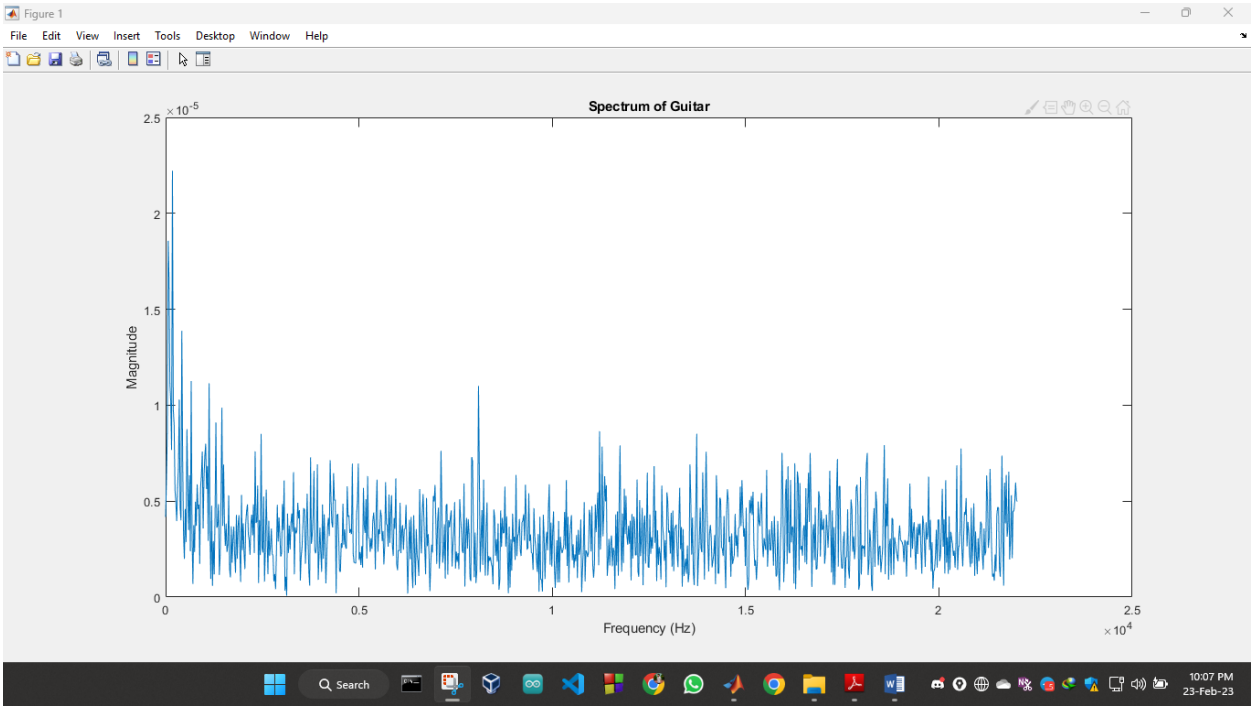
Semester : 2nd

Task 1:

Code:

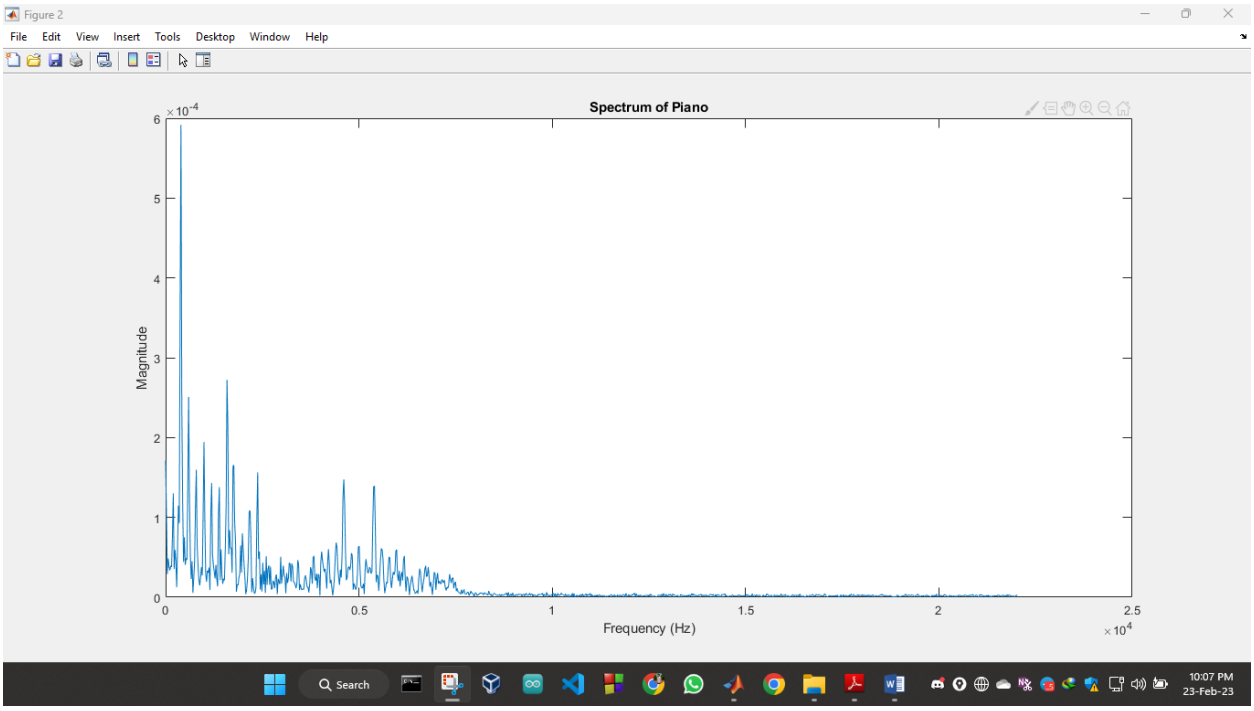


Guitar:



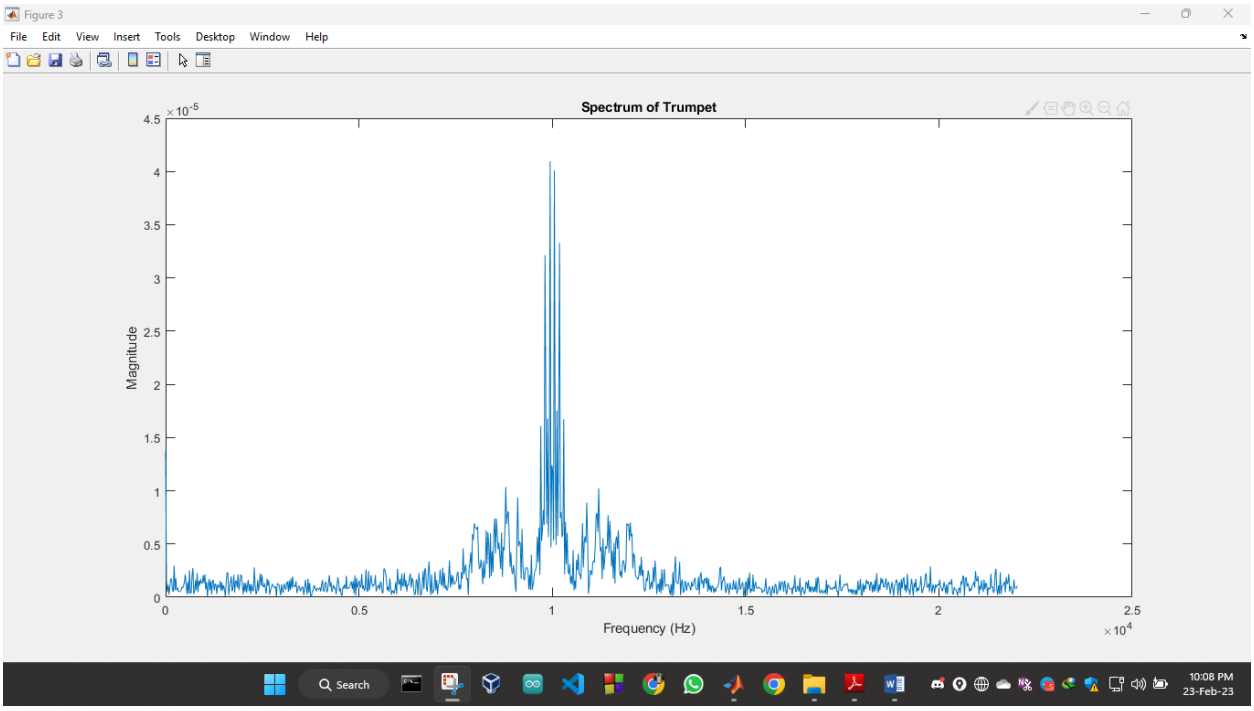
It has a frequency range between 0 Hz to 22010 Hz.

Piano:



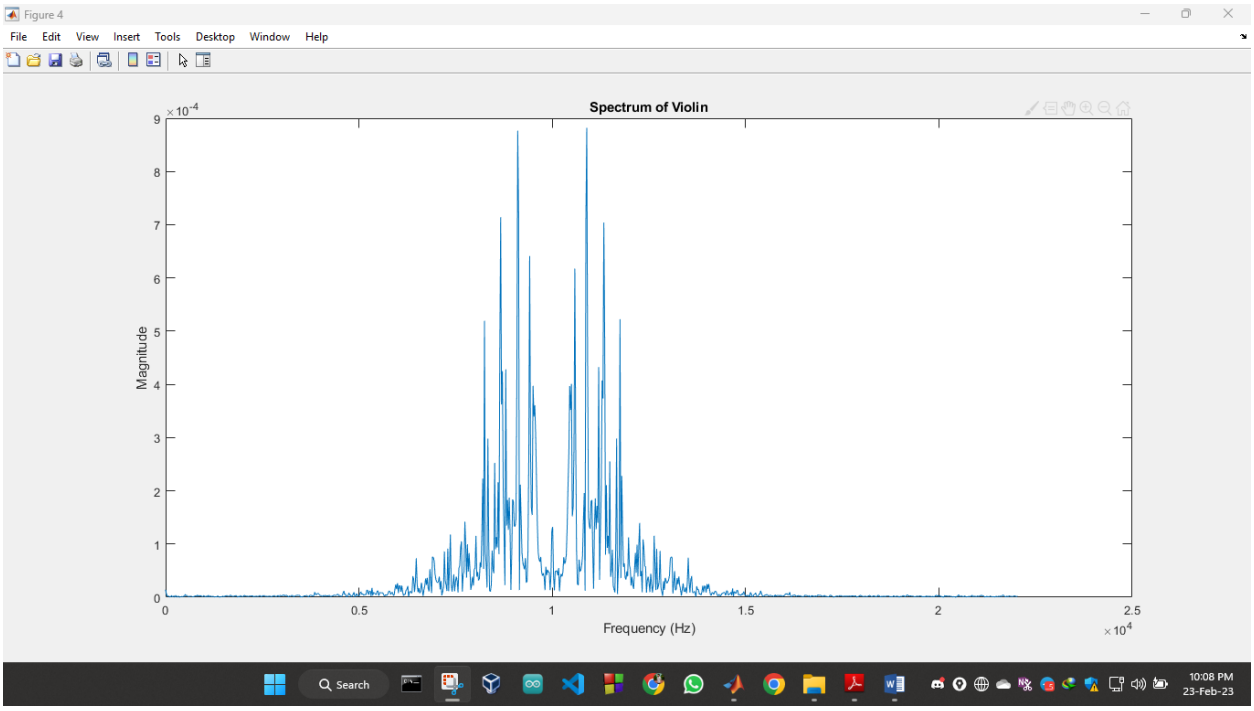
It has a frequency range between 0 Hz to 7629 Hz.

Trumpet:



It has a frequency range between 0 Hz to 22030 Hz.

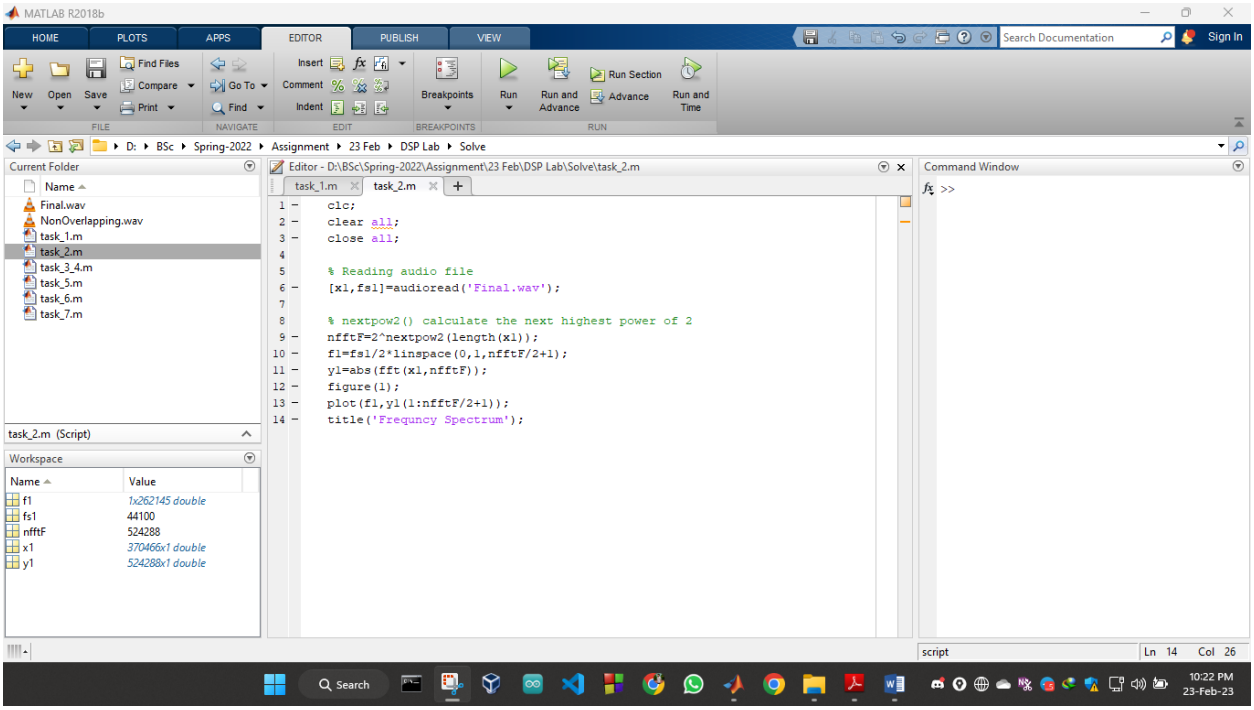
Violin:



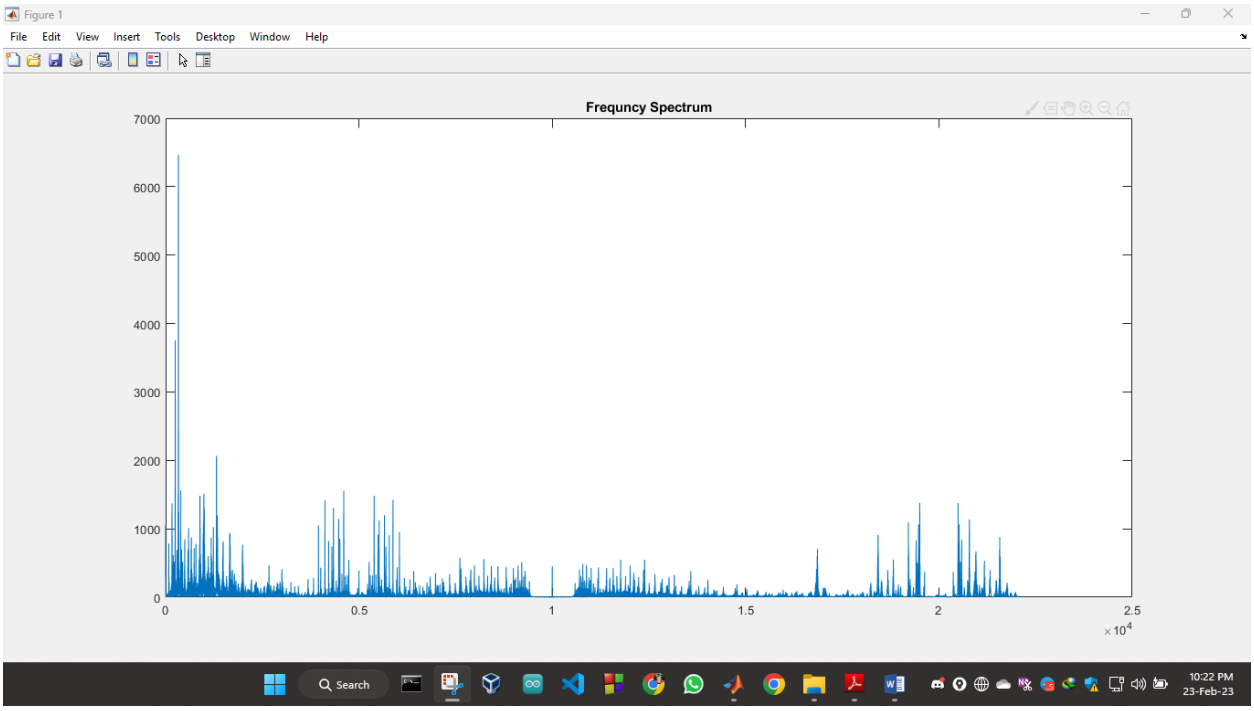
It has a frequency range between 5005 Hz to 16140 Hz.

Task 2:

Code:



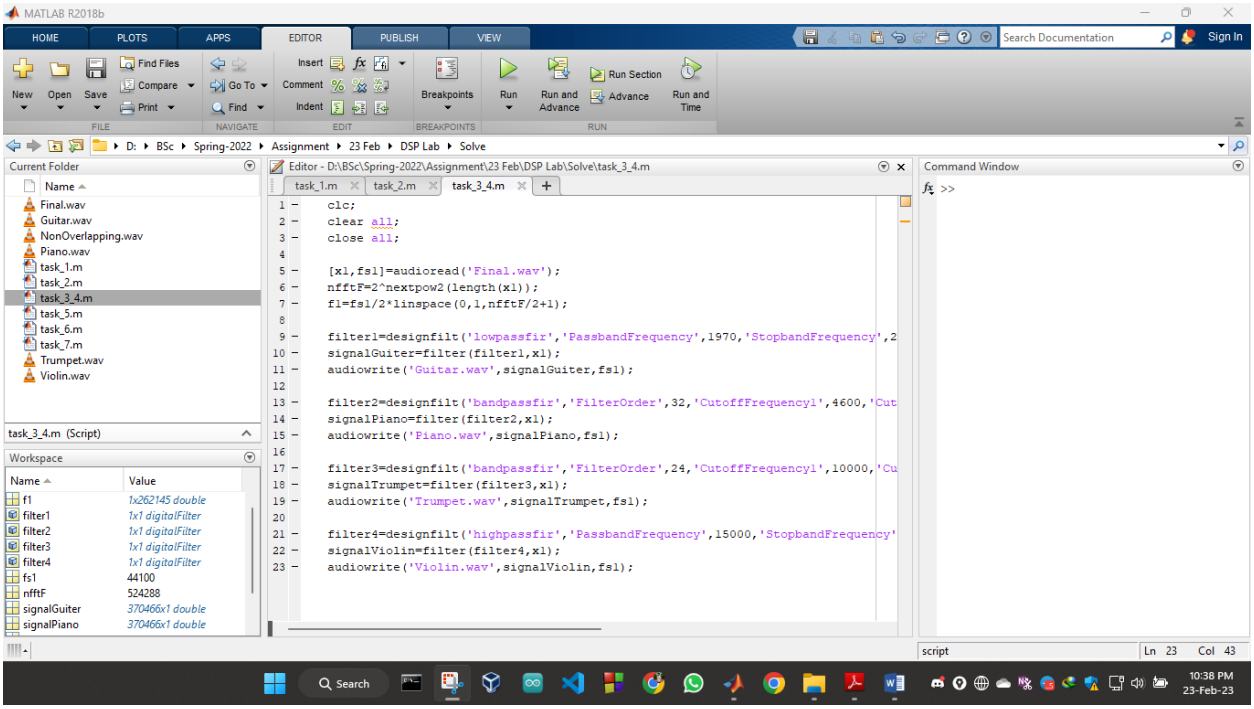
Spectrum:



The frequency range is between 0 Hz to 22050 Hz.

Task 3 & 4:

Code:



Guitar: Guitar uses low pass filter with pass band frequency of 1970 Hz, stopband frequency of 2290 Hz, pass band ripple 1, stopband attenuation of 94.

Piano: Piano uses band pass filter with order 32, cutoff frequency 4600Hz and 6100 Hz.

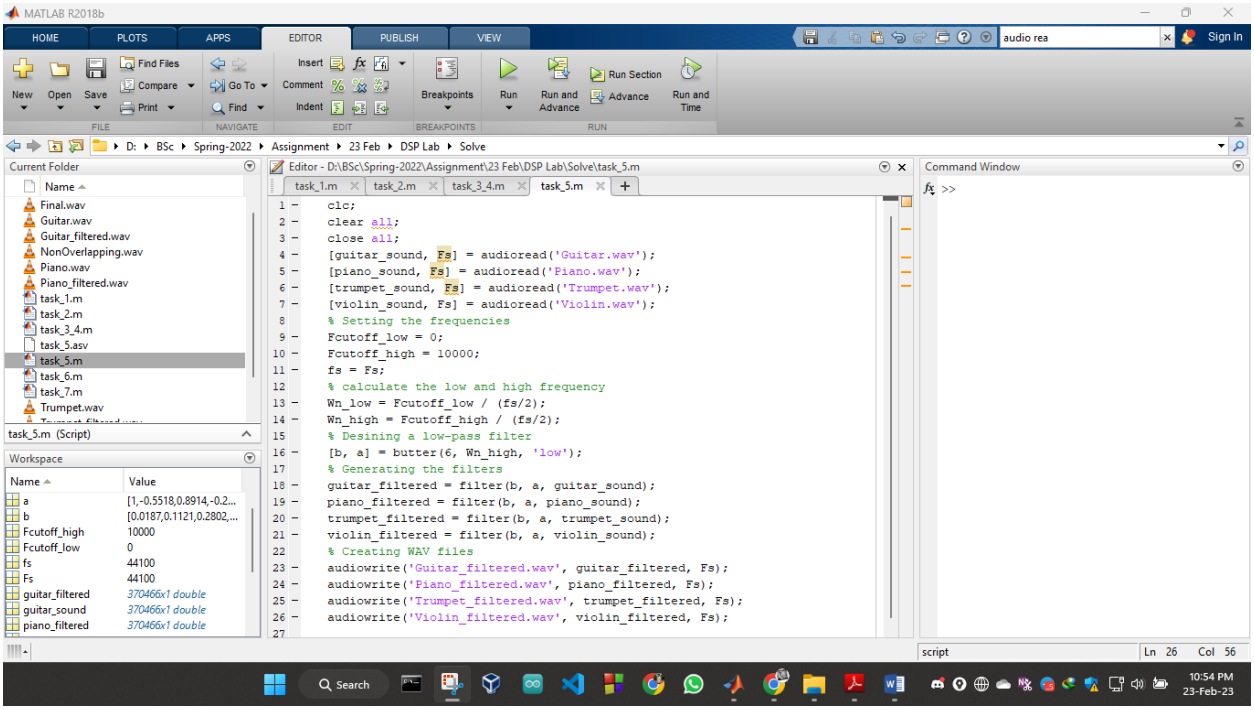
Trumpet: Trumpet uses band pass filter with filter order 24, cutoff frequency 10000Hz and 11000 Hz.

Violin: Violin uses high pass filter with pass band frequency of 15000 Hz, stopband frequency of 14900 Hz, pass band ripple 1, stopband attenuation of 77.

Extracted files are Guitar.wav, Piano.wav, Trumpet.wav and Violin.wav.

Task 5:

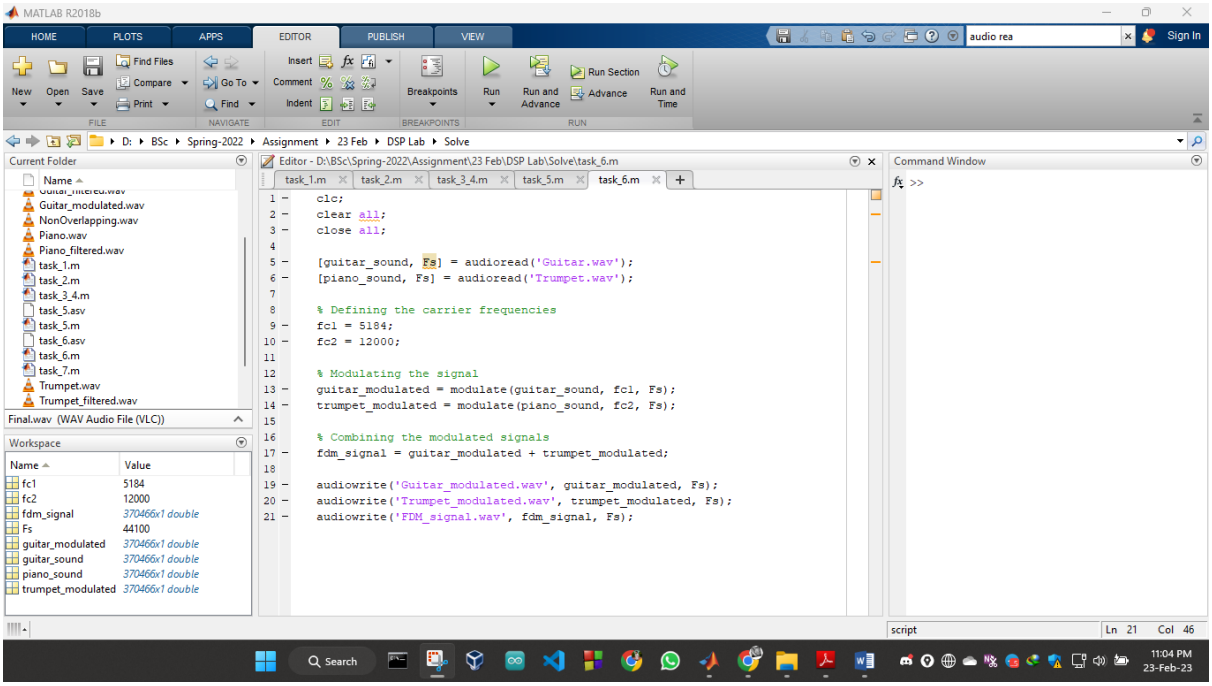
I can pass the individual wav files separately through a channel of bandwidth 0 to 10 kHz by setting the lower frequency to 0 Hz and higher frequency to 10000 Hz and using the low pass filter with butter function with filter order 6.



Task 6:

Sending guitar and trumpet signals through a 2-channel FDM link using carrier frequency of 5184 Hz and 12000 Hz.

Code:



Task 7:

Code: