EX:

Write a Matlab® script file that does the following:

i) Loads the sound file for Handel's Messiah into variable `y`.

ii) Shortens `y to 8000 samples.`

iii) Computes the Fast Fourier Transform (FFT) of `y and stores it in yfft.` `(The values in yfft represent frequency content for frequencies 0 to 7999 Hz.)`

iv) Multiplies the samples in `yfft by the following function:`

$$F(f) = \begin{cases} 1 + \dfrac{f}{2000} & 0 \le f \le 3999 \\ 1 + \dfrac{8000 - f}{2000} & 4000 \le f \le 7999 \end{cases}$$

where f is the frequency of the sample in yfft.

v) Takes the inverse FFT of the modified `yfft and stores it in yout.`

vi) Plays the sound in `yout`.

SOL'N:

```
% high_boost.m    Emphasize high frequency in signal

% Load snippet of Handel.
load handel

% Shorten the sound.
y = y(1:8000);

% Take Fast Fourier Transform of sound in y.
yfft = fft(y);

% Multiply fft samples to emphasize high frequencies.
yfft(1:4000) = yfft(1:4000) .* (1 + (0:3999)/2000)';
yfft(4001:8000) = yfft(4001:8000) .* (1 + (8000-
(4000:7999))/2000)';

% Take the inverse fft.
yout = ifft(yfft);

% Play the sound (but extract the real part first).
sound(real(yout))
```