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 sum of magnitudes squared of `y`, saving the result in `p`.

iv) Multiplies `y` by the following function, saving the result in `ysin`:

$m(t) = \sin(\pi t)$ where t = 0, 1/8000, 2/8000, ... , 1 – 1/8000

v) Computes the sum of magnitudes squared of `ysin`, saving the result in `psin`.

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

vii) Multiplies `ysinfft` by the following scaling factor:

$$\sqrt{\frac{p}{psin}}$$

viii) Takes the inverse FFT of the modified `ysinfft and stores it in yout.`

ix) Plays the sound in `yout`, after taking the real part.

Sol'n: i)
```
load handel
```

ii)
```
y = y(1:8000);
```

iii)
```
p = sum(abs(y).^2);
```

iv)
```
ysin = y .* sin(pi*(0:1/8000:1-1/8000))';
```

v)
```
psin = sum(abs(ysin).^2);
```

vi)
```
ysinfft = fft(ysin);
```

vii)
```
ysinfft = ysinfft * sqrt(p/psin);
```

viii)
```
yout = ifft(ysinfft);
```

ix)
```
sound(real(yout))
```