```matlab
AudioFile = '457 Audio Signal.unknown';
[x,fs] = audioread(AudioFile);

Fs = 100; % sampling frequency 1 kHz
t =  [0,10,20,30,40,50,60,70,80,90]; % time scale
x = [10,120,130,120,120,100,123,456,78,89]; % time series
x = x - mean(x);
plot(t,x), axis('tight'), grid('on'), title('Time series'), figure
```
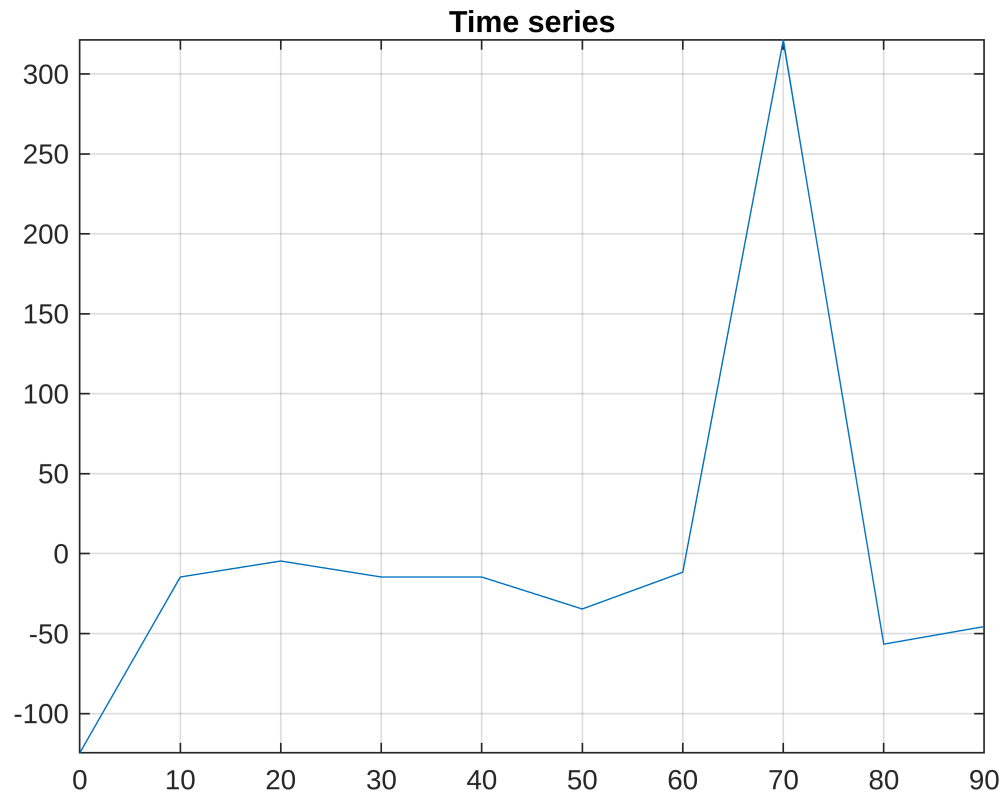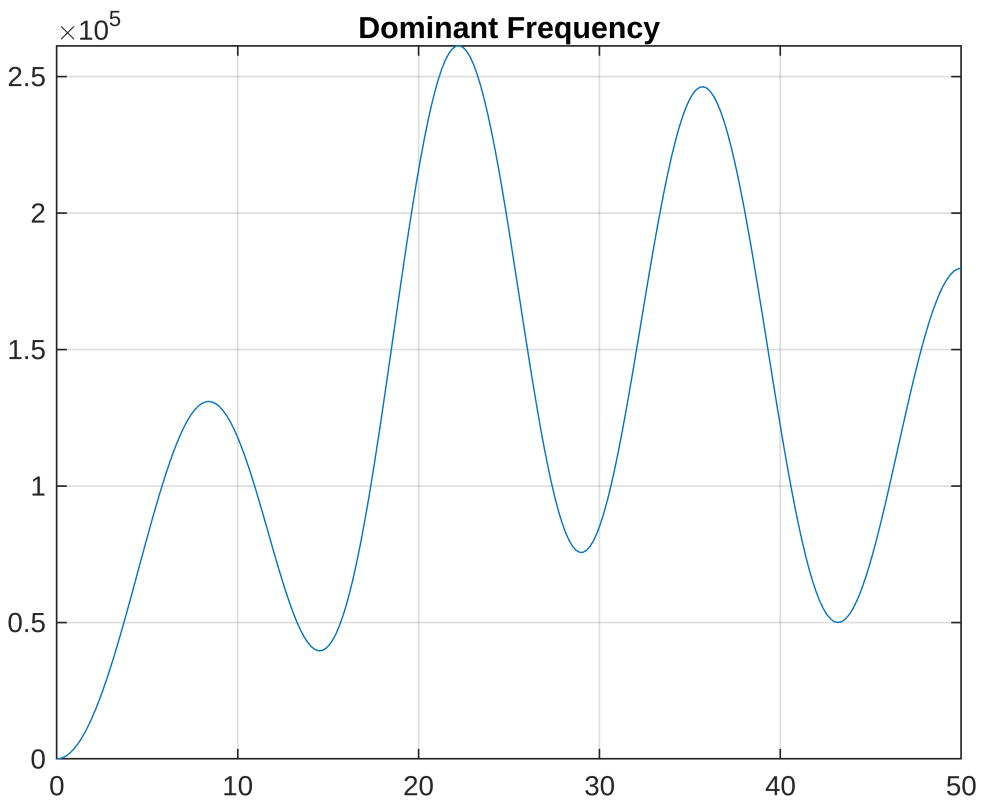
Time series


```matlab
nfft = 512; % next larger power of 2
y = fft(x,nfft); % Fast Fourier Transform
y = abs(y.^2); % raw power spectrum density
y = y(1:1+nfft/2); % half-spectrum
[v,k] = max(y); % find maximum
f_scale = (0:nfft/2)* Fs/nfft; % frequency scale
plot(f_scale, y),axis('tight'),grid('on'),title('Dominant Frequency')
```

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Dominant Frequency


```
fest = f_scale(k); % dominant frequency estimate
fprintf('Dominant freq.: true %f Hz, estimated %f Hznn\n', fest, fest)
```

Dominant freq.: true 22.265625 Hz, estimated 22.265625 Hznn

```
fprintf('Frequency step (resolution) = %f Hznn\n', f_scale(2))
```

Frequency step (resolution) = 0.195312 Hznn