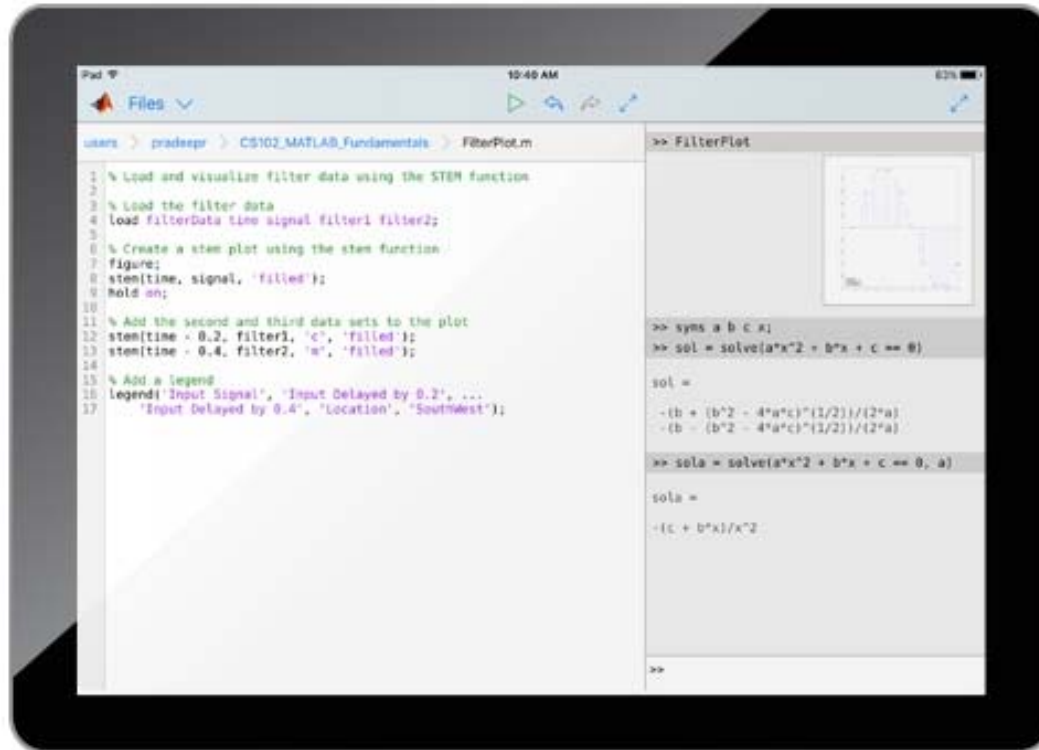


# MATLAB

- We assume that you have access to MATLAB
  - for example, in computer lab

# MATLAB Mobile



The following features are not supported:



- Viewing, editing, or evaluating live scripts with the Live Editor
- Using MATLAB apps, such as Curve Fitting
- Creating apps with App Designer
- Interacting with 3D figures
- Opening or creating models using the Simulink graphical environment

# MATLAB Mobile


- It is difficult to upload files into the free version.
- Have to copy and paste the content one by one.
- Alternatively, can try to put all necessary scripts in one file.


# MATLAB Mobile: Ex. 1


16:03 Thu 12 Sep

Files  Files 



MATLAB Drive

 Published  
9/9/2562 BE 16:25

 plotspect.m  
12/9/2562 BE 15:54

 specrect.m  
12/9/2562 BE 15:55



16:01 Thu 12 Sep

Files  Files 

MATLAB Drive > plotspect.m

```
1 % plotspect(x,t) plots the spectrum of the signal x
2 % whose values are sampled at time (in seconds) specified in t
3 function plotspect(x,t)
4 N=length(x); % length of the signal x
5 Ts = t(2)-t(1); % find the sampling
   interval
6 ssf=(-N/2):(N/2-1)/(Ts*N); % frequency vector
7 fx=Ts*fft(x(1:N)); % do DFT/FFT
8 fxs=fftshift(fx); % shift it for plotting
9 subplot(2,1,1);
10 set(plot(t,x),'LineWidth',1.5); % plot the waveform
11 xlabel('Seconds'); % label the axes
12 subplot(2,1,2);
13 set(plot(ssf,abs(fxs)),'LineWidth',1.5); % plot magnitude spectrum
14 xlabel('Frequency [Hz]'); ylabel('Magnitude') % label the axes
15 end
16
```

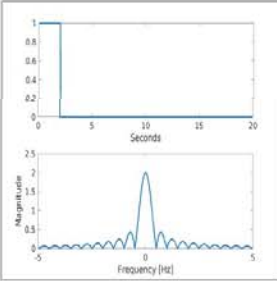
16:00 Thu 12 Sep

Files  Files 

MATLAB Drive > specrect.m

```
1 % specrect.m plot the spectrum of a square wave
2 close all
3 time=20; % length of time
4 Ts=1/100; % time interval between samples
5 t=0:Ts:(time-Ts); % create a time vector
6 x=[t <= 2]; % rectangular pulse $1[0 \le t \le 2]$
7 plotspect(x,t) % call plotspect to draw spectrum
8 xlim([-5,5])
9
```

>> specrect



>>

# MATLAB Mobile: Ex. 2

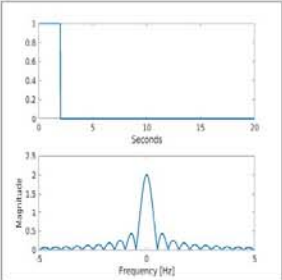
15:39 Thu 12 Sep 94%

Files

MATLAB Drive > test.m

```
1 % spectrect.m plot the spectrum of a square wave
2 close all
3 time=20; % length of time
4 Ts=1/100; % time interval between samples
5 t=0:Ts:(time-Ts); % create a time vector
6 x=[t <= 2]; % rectangular pulse  $[0 \leq t \leq 2]$ 
7 plotspect(x,t) % call plotspect to draw spectrum
8 xlim([-5,5])
9
10
11
12 % plotspect(x,t) plots the spectrum of the signal x
13 % whose values are sampled at time (in seconds) specified in t
14 function plotspect(x,t)
15 N=length(x); % length of the signal x
16 Ts = t(2)-t(1); % find the sampling
    interval
17 ssf=(-N/2):(N/2-1)/(Ts*N); % frequency vector
18 fx=Ts*fft(x(1:N)); % do DFT/FFT
19 fxs=fftshift(fx); % shift it for plotting
20 subplot(2,1,1);
21 set(plot(t,x),'LineWidth',1.5); % plot the waveform
22 xlabel('Seconds'); % label the axes
23 subplot(2,1,2);
24 set(plot(ssf,abs(fxs)),'LineWidth',1.5); % plot magnitude spectrum
25 xlabel('Frequency [Hz]'); ylabel('Magnitude') % label the axes
26 end
27
28
29
30
```

>> test



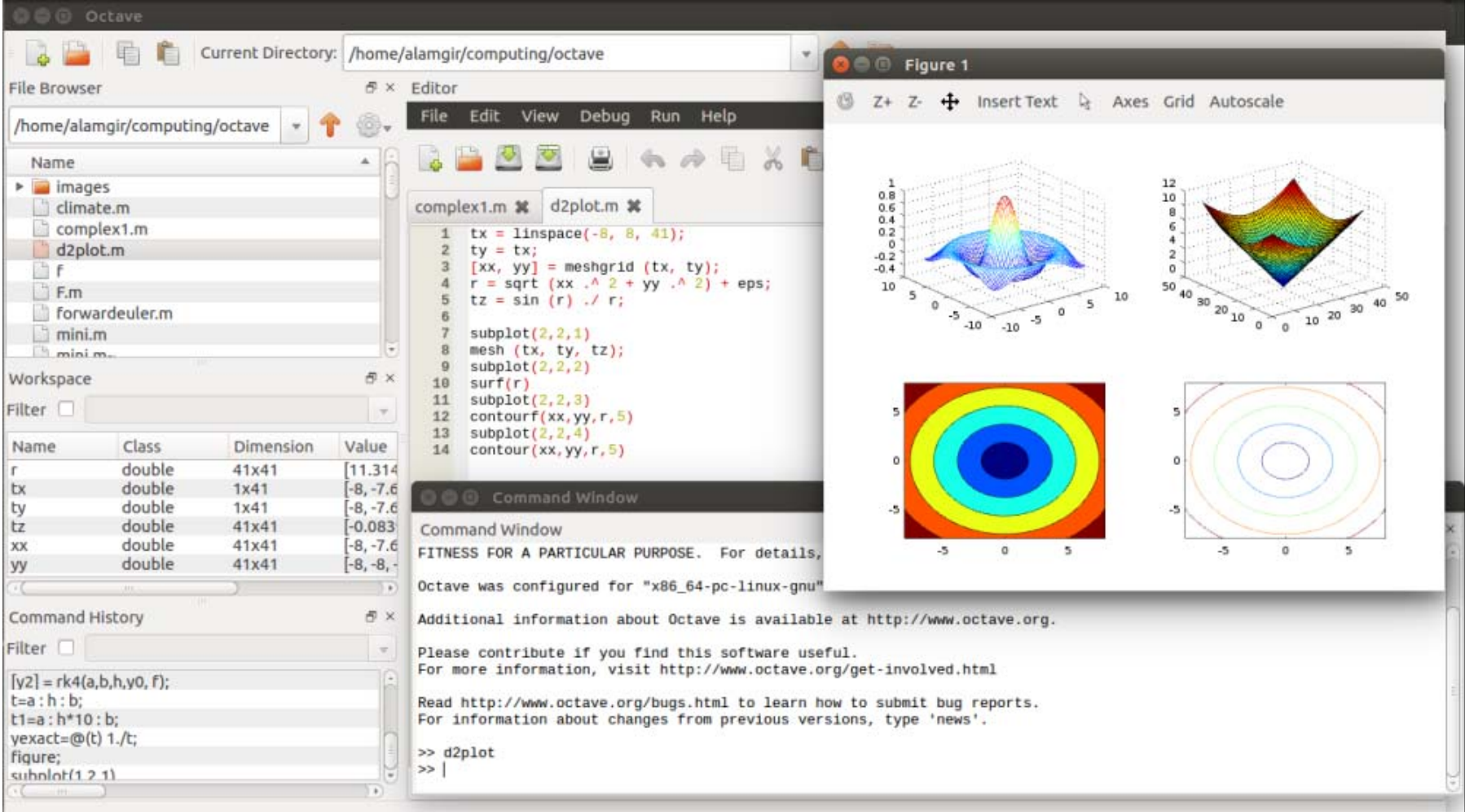
>>

We see that spectrect needs plotspec.

So we paste the scripts inside the plotspec file here.

# GNU Octave

<https://www.gnu.org/software/octave/>



The screenshot displays the GNU Octave environment. On the left, the File Browser shows the current directory `/home/alamgir/computing/octave` with files like `climate.m`, `complex1.m`, and `d2plot.m`. The Workspace panel lists variables: `r` (41x41 double), `tx` (1x41 double), `ty` (1x41 double), `tz` (41x41 double), `xx` (41x41 double), and `yy` (41x41 double). The Command History shows the execution of `figure;` and `subplot(1 2 1)`.

The Editor window shows the code in `d2plot.m`:

```
1 tx = linspace(-8, 8, 41);
2 ty = tx;
3 [xx, yy] = meshgrid(tx, ty);
4 r = sqrt(xx.^2 + yy.^2) + eps;
5 tz = sin(r) ./ r;
6
7 subplot(2,2,1)
8 mesh(tx, ty, tz);
9 subplot(2,2,2)
10 surf(r)
11 subplot(2,2,3)
12 contourf(xx, yy, r, 5)
13 subplot(2,2,4)
14 contour(xx, yy, r, 5)
```

The Command Window displays the following text:

```
Command Window
FITNESS FOR A PARTICULAR PURPOSE. For details,
Octave was configured for "x86_64-pc-linux-gnu"
Additional information about Octave is available at http://www.octave.org.
Please contribute if you find this software useful.
For more information, visit http://www.octave.org/get-involved.html
Read http://www.octave.org/bugs.html to learn how to submit bug reports.
For information about changes from previous versions, type 'news'.
>> d2plot
>> |
```

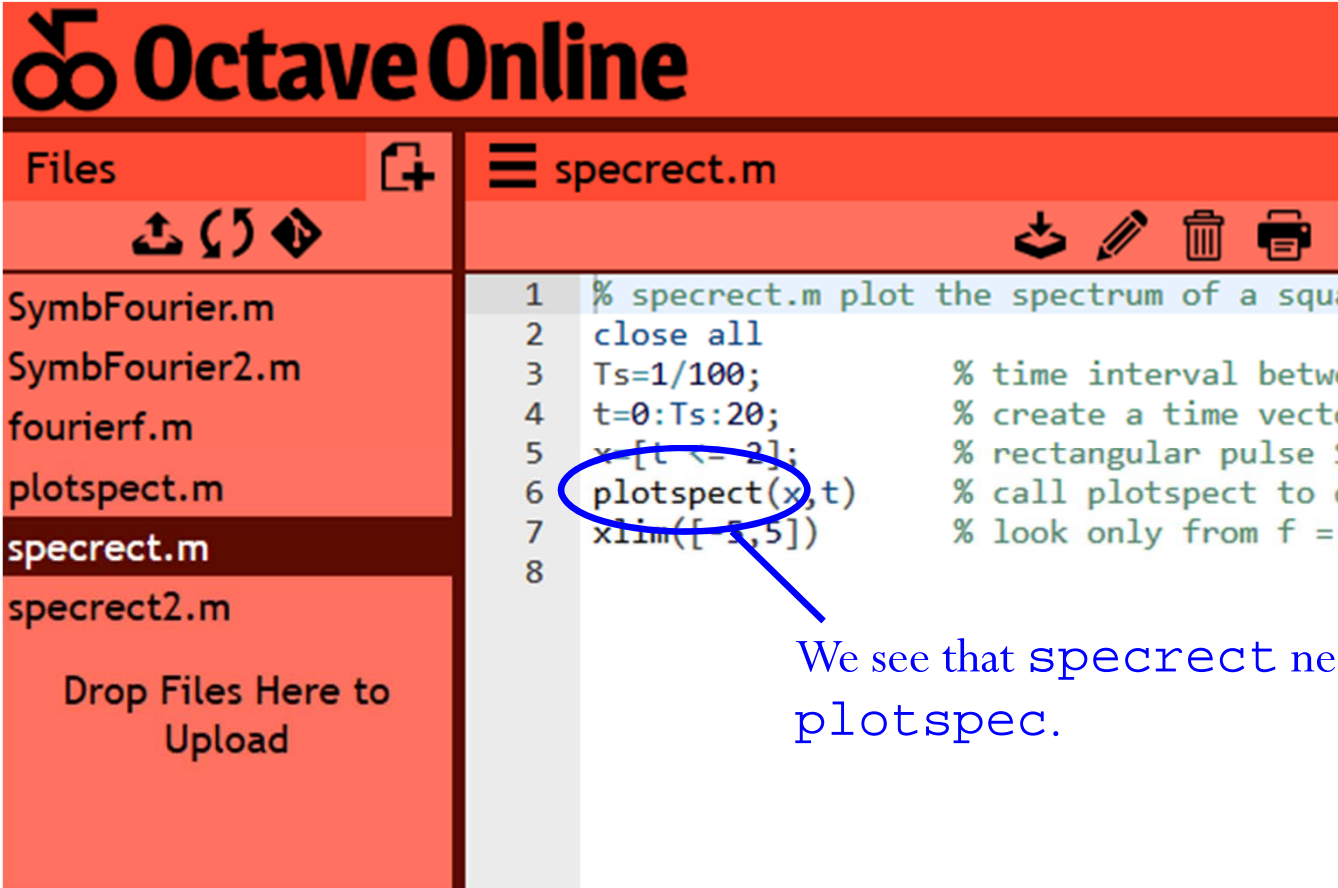
The Figure window (Figure 1) displays four plots arranged in a 2x2 grid:

- Top-left: A 3D surface plot of `tz` over the domain `[-8, 8] x [-8, 8]`.
- Top-right: A 3D surface plot of `r` over the domain `[-8, 8] x [-8, 8]`.
- Bottom-left: A 2D contour plot of `r` over the domain `[-8, 8] x [-8, 8]`.
- Bottom-right: A 2D contour plot of `r` over the domain `[-8, 8] x [-8, 8]`.


# OctaveOnline








<https://octave-online.net/>

Upload the posted scripts/functions into the app.



**Octave Online**

Files  **specrect.m**

SymbFourier.m  
SymbFourier2.m  
fourierf.m  
plotspect.m  
**specrect.m**  
specrect2.m

Drop Files Here to Upload

```
1 % specrect.m plot the spectrum of a square pulse
2 close all
3 Ts=1/100; % time interval between samples
4 t=0:Ts:20; % create a time vector
5 x=[t <= 2]; % rectangular pulse of height 1
6 plotspect(x,t) % call plotspect to plot the spectrum
7 xlim([-5,5]) % look only from f = -5 to 5 Hz
8
```

We see that specrect need plotspec.

# OctaveOnline

OctaveOnline

MENU

Files + ≡ spectrect.m RUN ▶ Vars

```
1 % spectrect.m plot the spectrum of a square wave
2 close all
3 Ts=1/100; % time interval between adjacent samples
4 t=0:Ts:20; % create a time vector
5 x=[t <= 2]; % rectangular pulse $1[0 \leq t \leq 2]$
6 plotspect(x,t) % call plotspect to draw spectrum
7 xlim([-5,5]) % look only from f = -5 to f = 5 Hz
8
```

# Ts  
{1x9} ans  
[1x2001] t  
[1x2001]- x

Drop Files Here to Upload

octave:2> source("spectrect.m")

