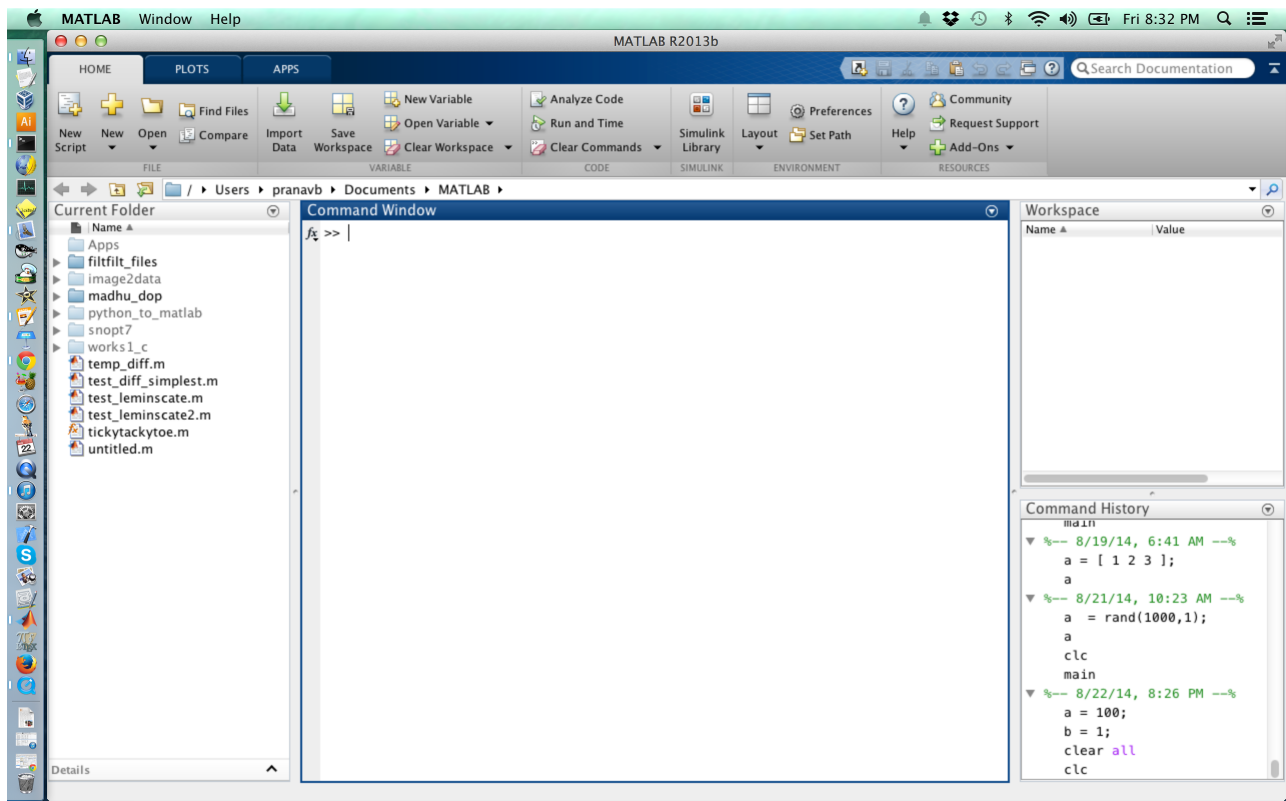Pranav Bhounsule
MATLAB Scripts creating animations

1. Start MATLAB by navigating through your installed application or click the short cut icon for MATLAB shown next.
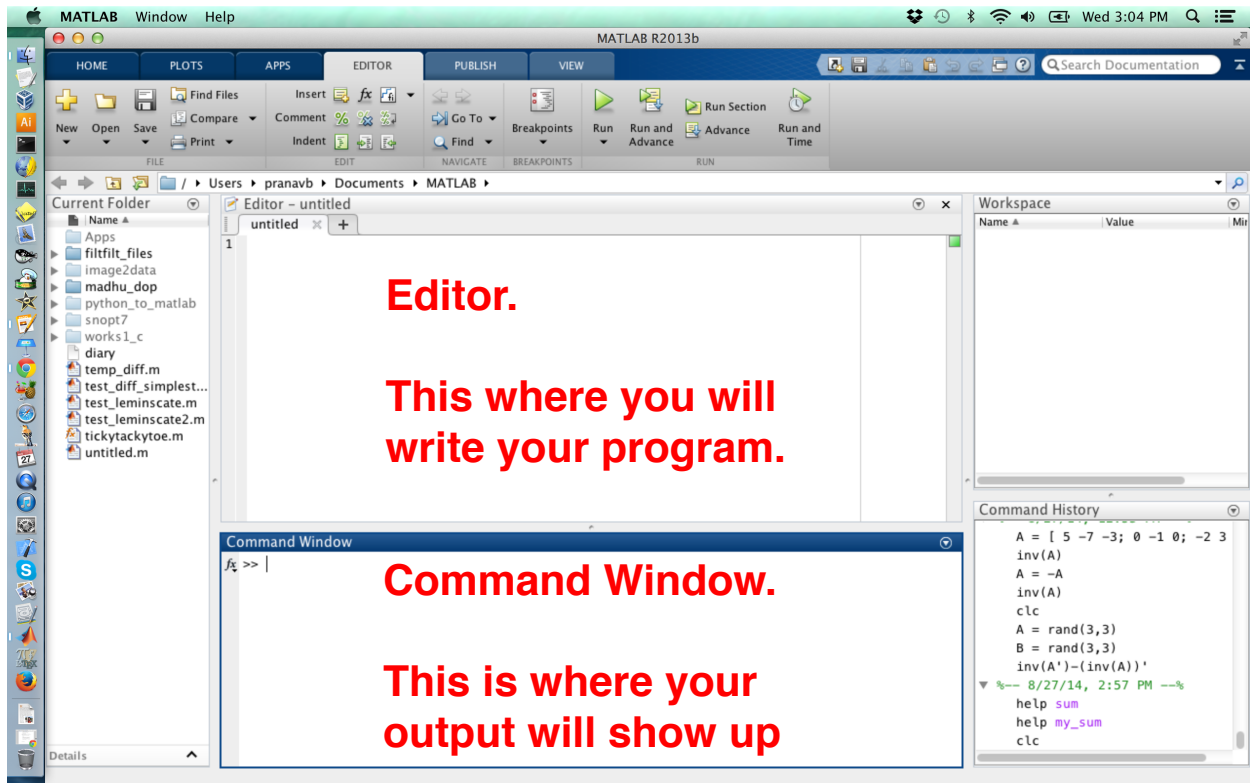

2. You will see the following screen once MATLAB loads up.

If you don't see something like that above, then go to Layout > Default Layout.

3. We will write a script file. To do this go to *New > Script file*. Now your MATLAB window will look something like this.

4. **Sliding a marker on the sine curve**

Open a new script file, *New > Script file*.
Type or copy-paste the code below

%%%%%%% Copy paste the code below %%%%%%%

```
clc %clear screen
clear all %clear all workspace variables.
close all %Close all figures.

x = linspace(0,2*pi); %Generate data
y = sin(x);
```

plot(x,y); %plot sine curve
hold on; %prevent MATLAB from erasing the sine curve

for i=1:length(x)
    h=plot(x(i),y(i),'go','MarkerFacecolor','g','Markersize',10); %move the marker
    pause(0.1); %delay to give the effect of an animation
    delete(h); %delete the marker
end

%%%%%%% Code ends here %%%%%%%%%%%%%%%%%%%%

Now save the file, Save -> test_animation1.m
Next run the file, Run (press the green arrow button in the "Editor tab")
If everything worked fine then you will see the following figure displayed in MATLAB
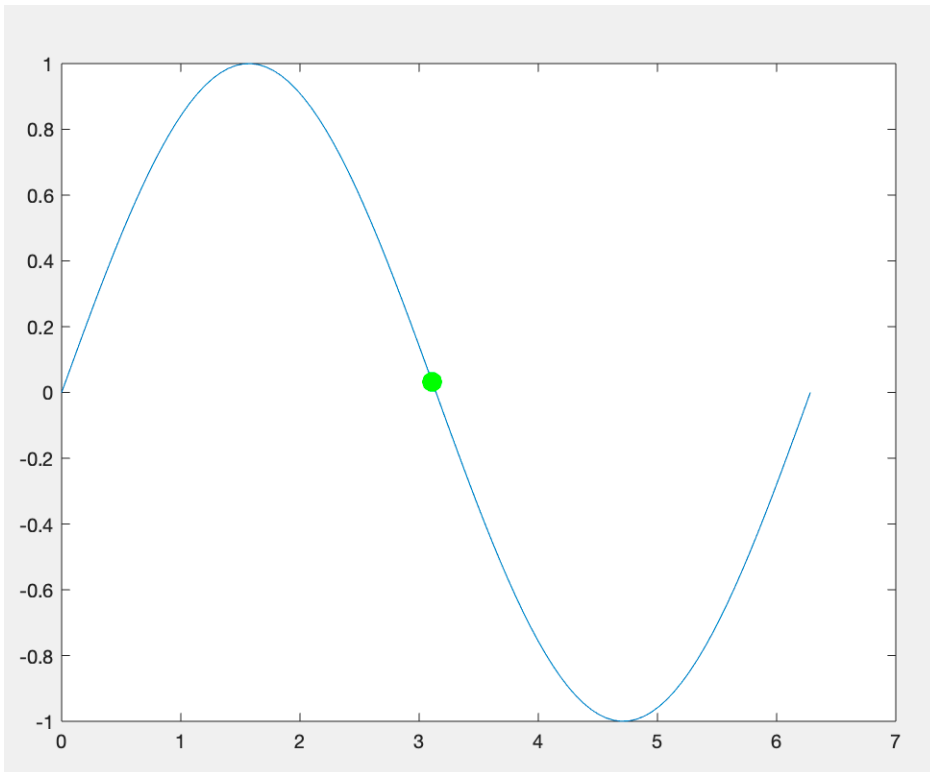
Note what is going on in the for loop: the green marker is plotted, then there is a brief pause, the green marker is then erased using delete. This process is continued till the marker reaches the end.

5. **Drawing shapes (circles, squares, etc) using patch**

Open a new script file, *New > Script file*.
Type or copy-paste the code below

%%%%%%% Copy paste the code below %%%%%%%

```
clc
clear all
close all

%%%%%%% draw a circle and animate %%%
theta = linspace(0,2*pi);
x_circle = sin(theta);
y_circle = cos(theta);
patch(x_circle,y_circle,'r'); hold on;
axis('equal');

%%%%%%% draw a rectangle, 2 units along x-axis and 1 unit along y-axis %%%
x_rectangle =  [0 2 2 0];
y_rectangle =  [0 0 1 1];
patch(x_rectangle,y_rectangle,'b'); hold on;

%%%%%%% Code ends here %%%%%%%%%%%%%%%%%%
```
Now save the file, Save -> test_animation2.m
Next run the file, Run (press the green arrow button in the "Editor tab")
If everything worked fine then you will see the following figure displayed in MATLAB

If you want to translate the rectangle by 1 unit along x- and y-axis, add 1 unit along x- and y-axis to the x_rectangle and y_rectangle as shown below

```
x_rectangle = 1+ [0 2 2 0];
y_rectangle =  1+[0 0 1 1];
```
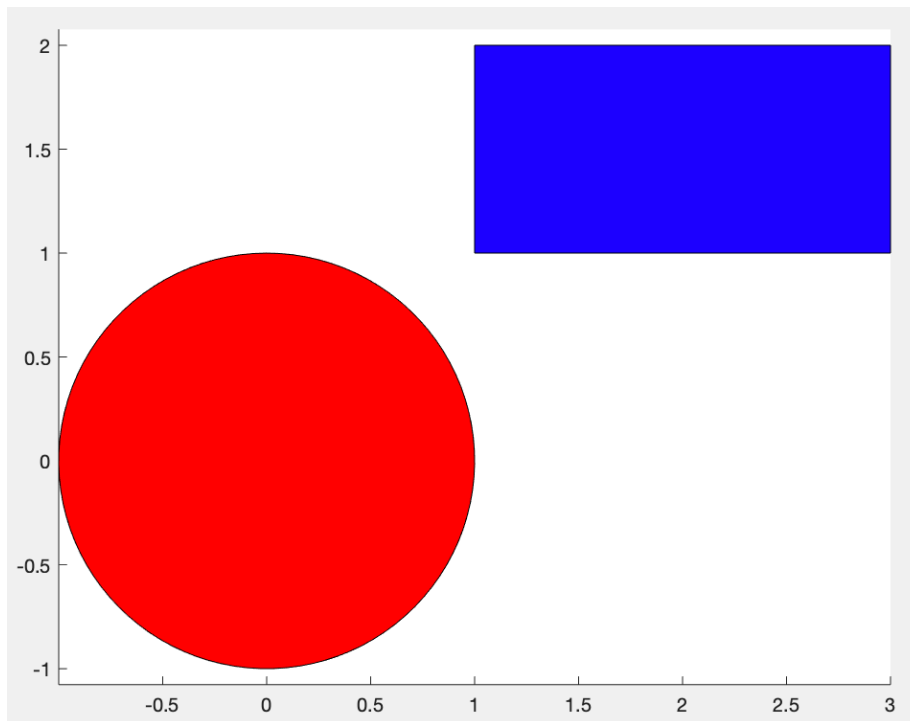
This code created a circle of radius 1 centered at the (0,0) and a rectangle with corners
(1,1), (1,3), (3,2), and (1,2) as shown above

6. **A rectangle moving along the circumference of a circle.**

```
clc
clear all
close all


%%%%%%%% Copy paste the code below %%%%%%%%


%%%%%% coordinates of moving rectangle  %%%%%%%%%%%%
x_rectangle =  [0 2 2 0];
y_rectangle =  [0 0 1 1];

%%%%%%%% coordinate of stationary circle of radius = r
t = linspace(0,5*pi);
r = 5;
x_center = r*cos(t); y_center = r*sin(t);
plot(x_center,y_center,'r:');  %plot the stationary circle
hold on;

%%%% get the rectangle to turn along the circumference of the circle %%%
for i=1:length(t)
    x_moving = x_center(i) + x_rectangle;
    y_moving = y_center(i) + y_rectangle;
    h=patch(x_moving,y_moving,'b');
    axis('equal');
    axis([-r-1 r+1 -r-1 r+1]);
```
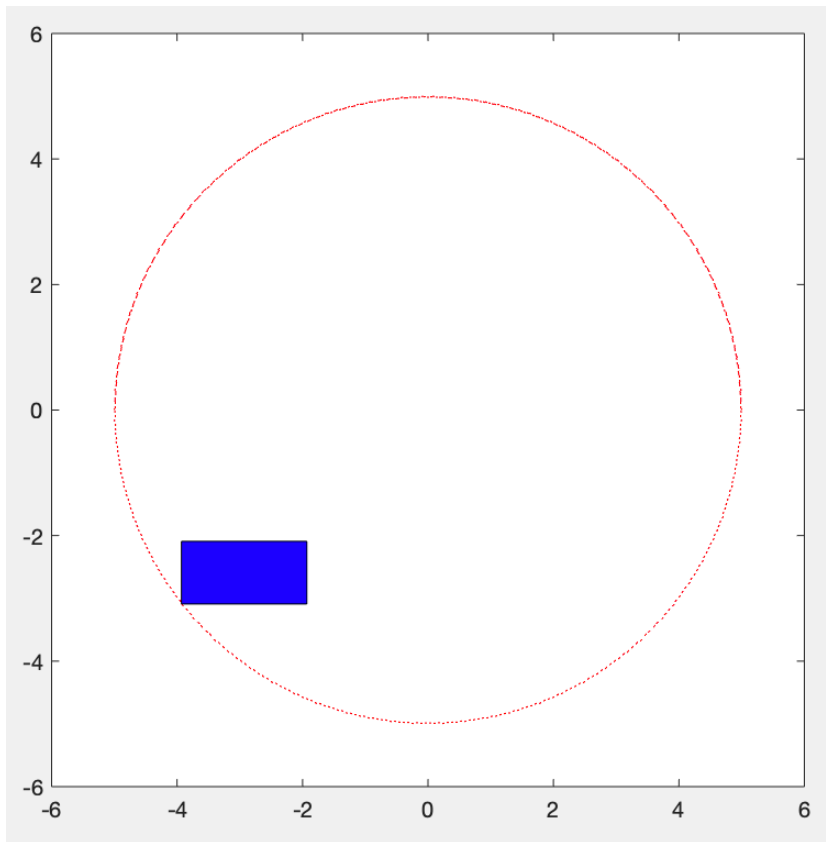
```
    pause(0.1);
    delete(h);
end

%%%%%%% Code ends
here %%%%%%%%%%%%
%%%%%

Now save the file, Save ->
test_animation3.m
Next run the file, Run
(press the green arrow
button in the "Editor tab")
If everything worked fine
then you will see the
following figure displayed in
MATLAB
```

This code created a stationary circle of radius 5 centered at (0,0). It also created a rectangle with corners at (0,0), (2,0), (2,1), and (0,1). Then the rectangle was translated to the circumference (e.g., x_circle + x_rectangle) and and moved along it.