University of Dayton

Lab 2

CPS 563 – Data Visualization

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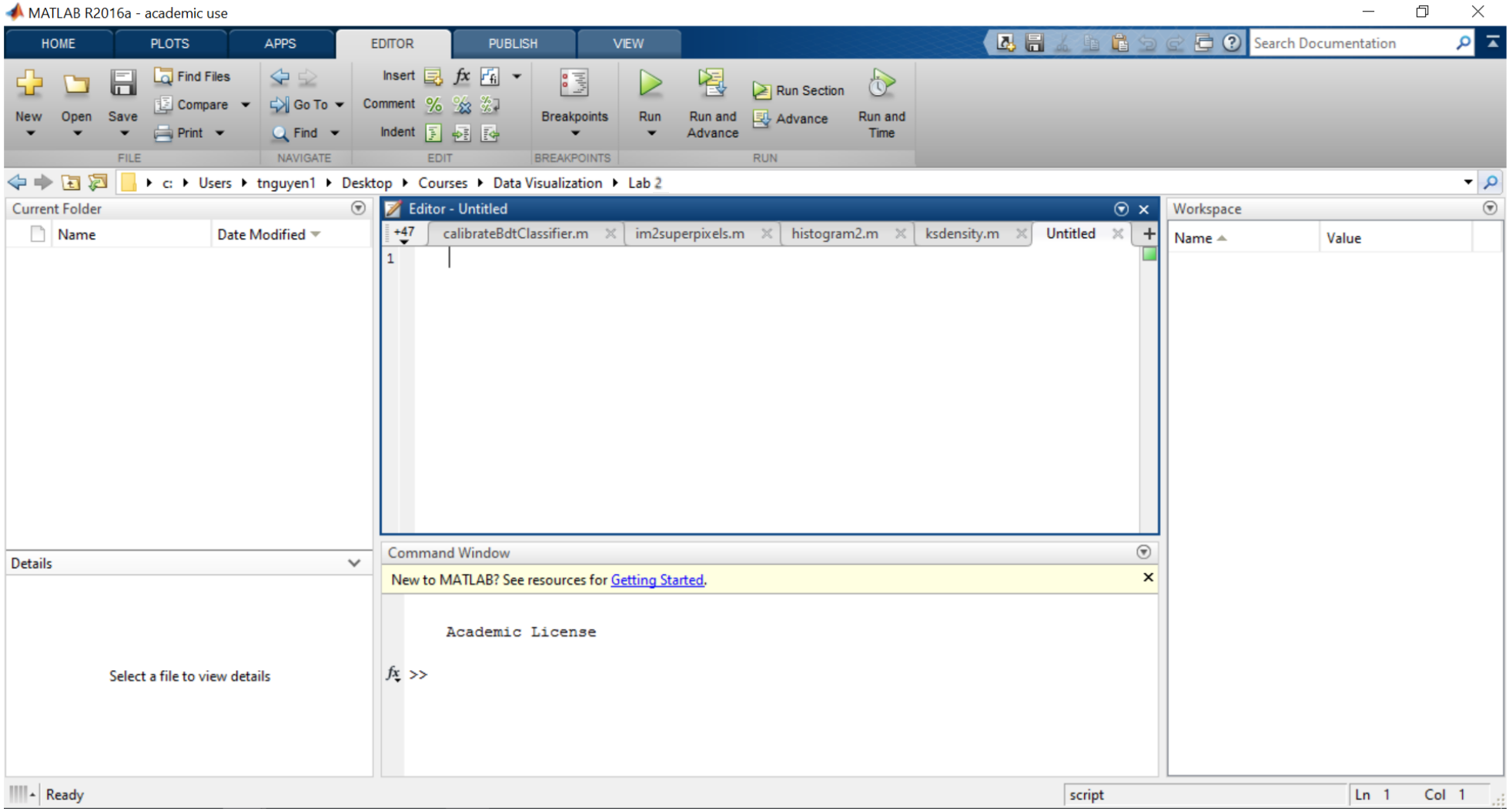
Start MATLAB



Hello World with MATLAB

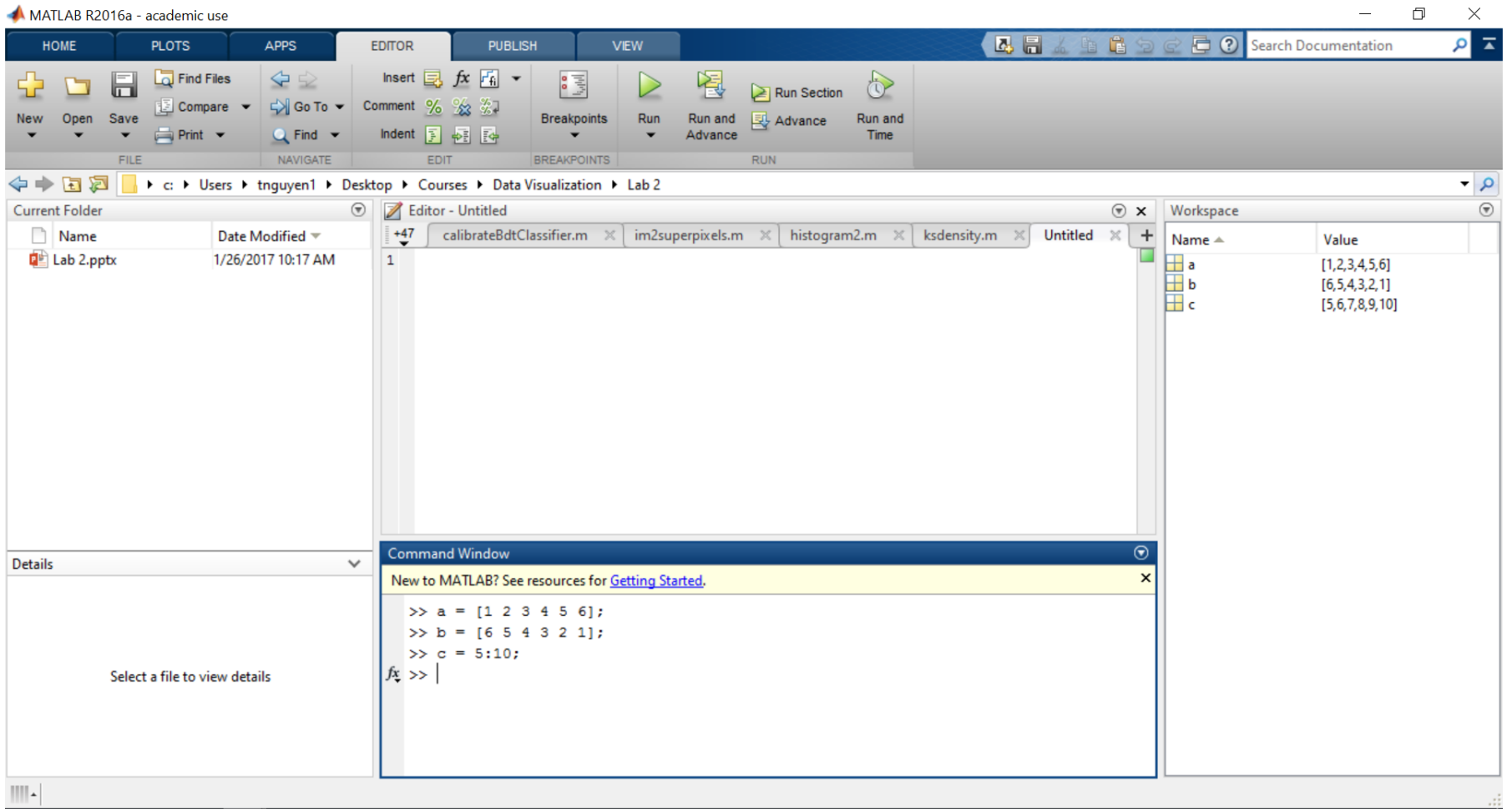
```
% Display text
disp('Hello World with MATLAB!');
```

String in MATLAB

```
str = ‘Hello World 2!’;
disp(str);
```

Array declaration

```
a = [1 2 3 4 5 6];
b = [6 5 4 3 2 1];
c = 5:10;
```



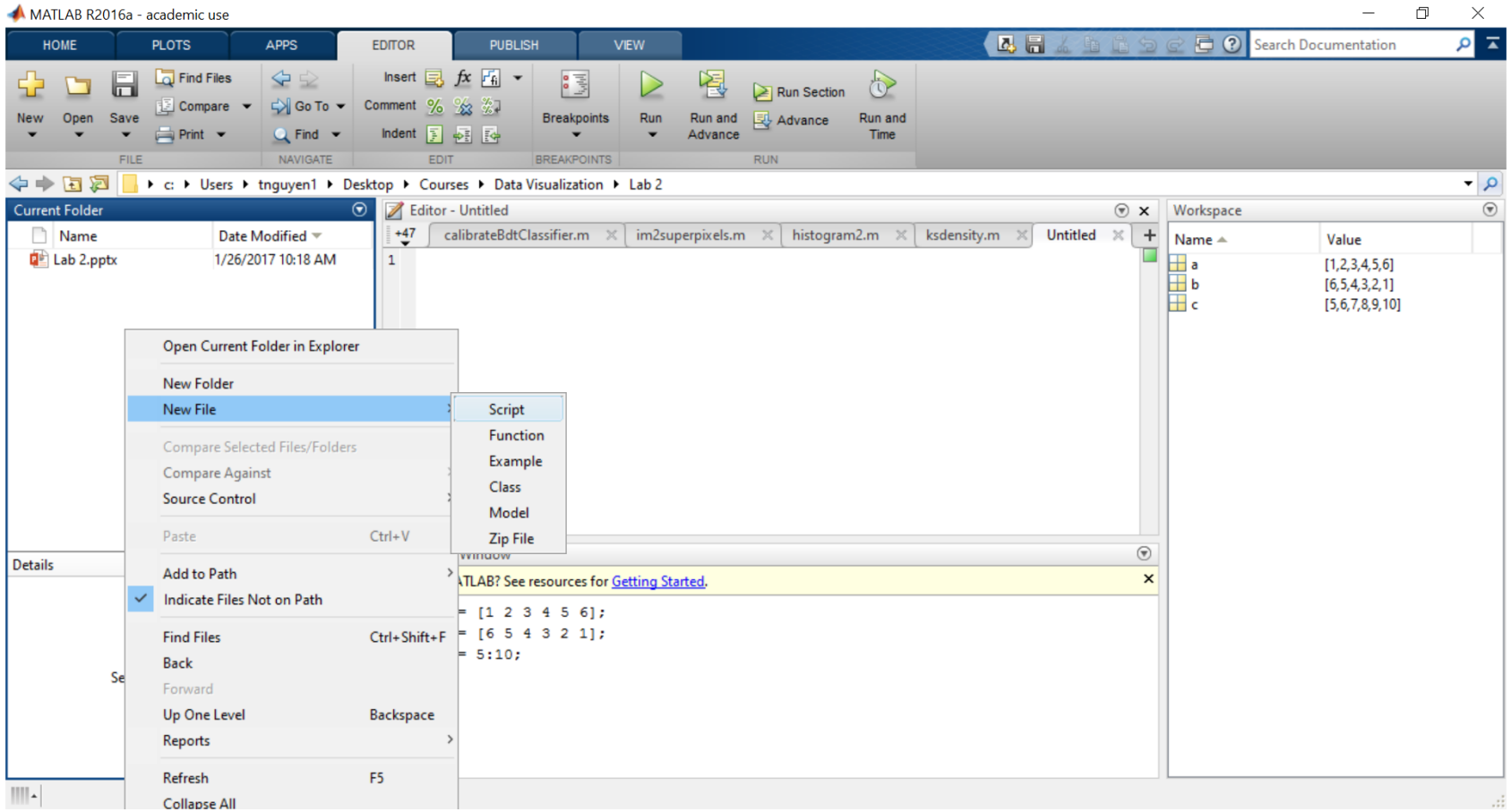
Some basic functions

- size_a = size(a);
- sum_a = sum(a);
- mean_a = mean(a);
- a_squared = a.^2;
- a_plus_b = a + b;
- a_minus_c = a – c;

Matrix declaration

- k = [1 2 3; 4 5 6; 7 8 9];
- l = k’;

Create a new MATLAB script: Lab2.m



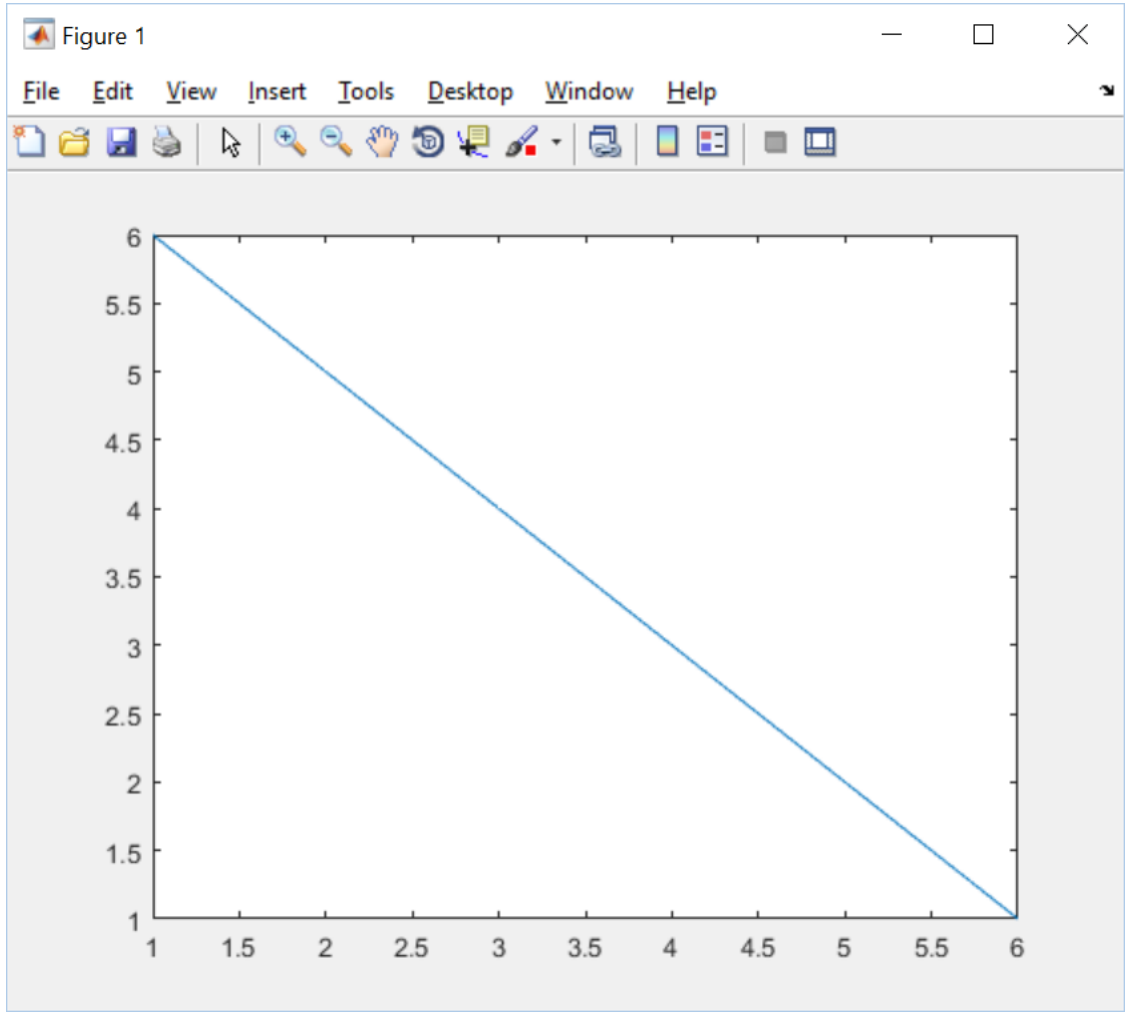
Loops

```
% for loop
a = [1 2 3 4 5 6];
count = 0;
for i = 1:6
        count = count + a(i);
end
disp(count);
```

Plot a line

```
% for loop
a = [1 2 3 4 5 6];
count = 0;
for i = 1:6
        count = count + a(i);
end
disp(count);
```

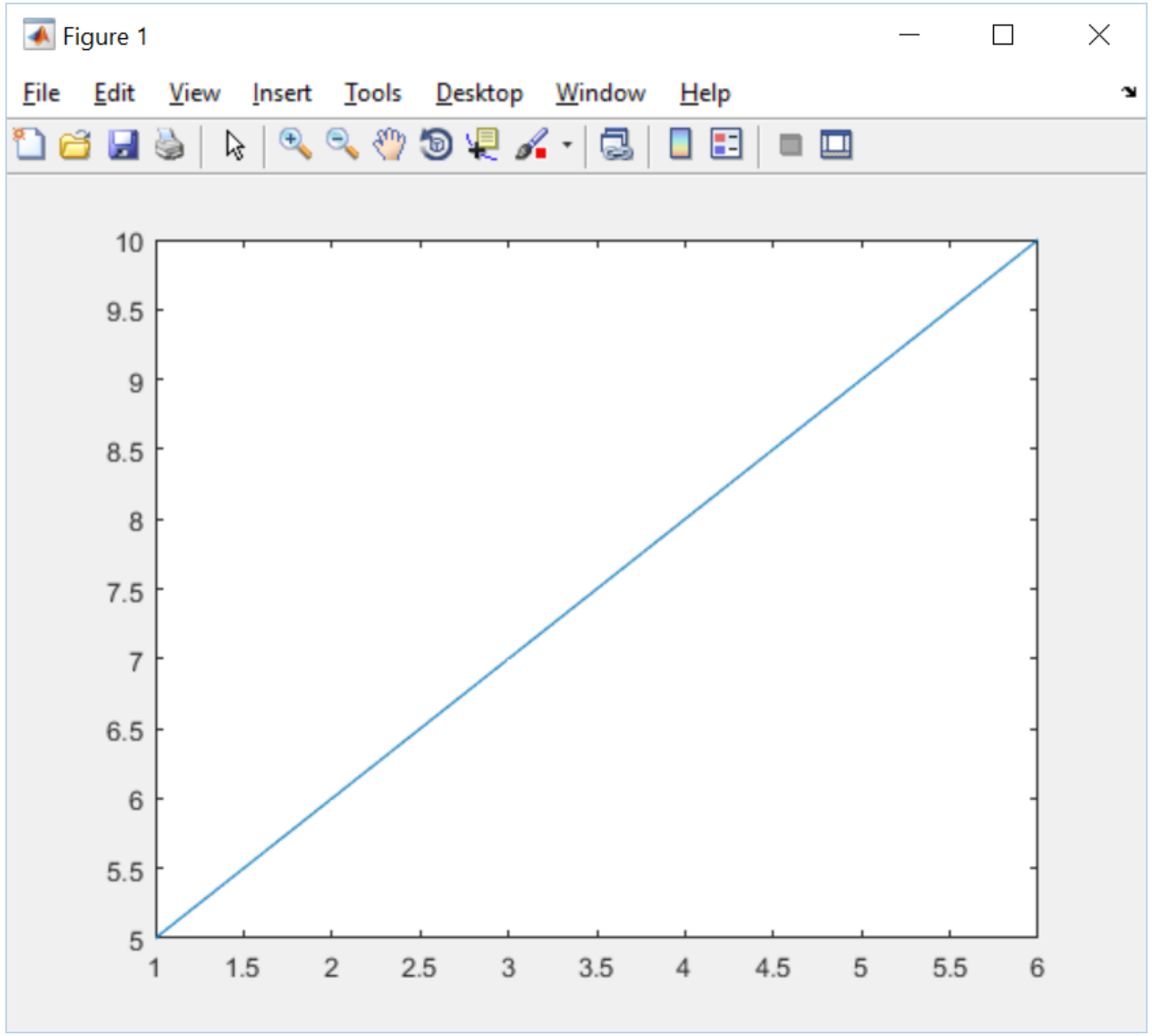
```
plot(a,b);
```



Plot another line

```
% for loop
a = [1 2 3 4 5 6];
count = 0;
for i = 1:6
        count = count + a(i);
end
disp(count);
```

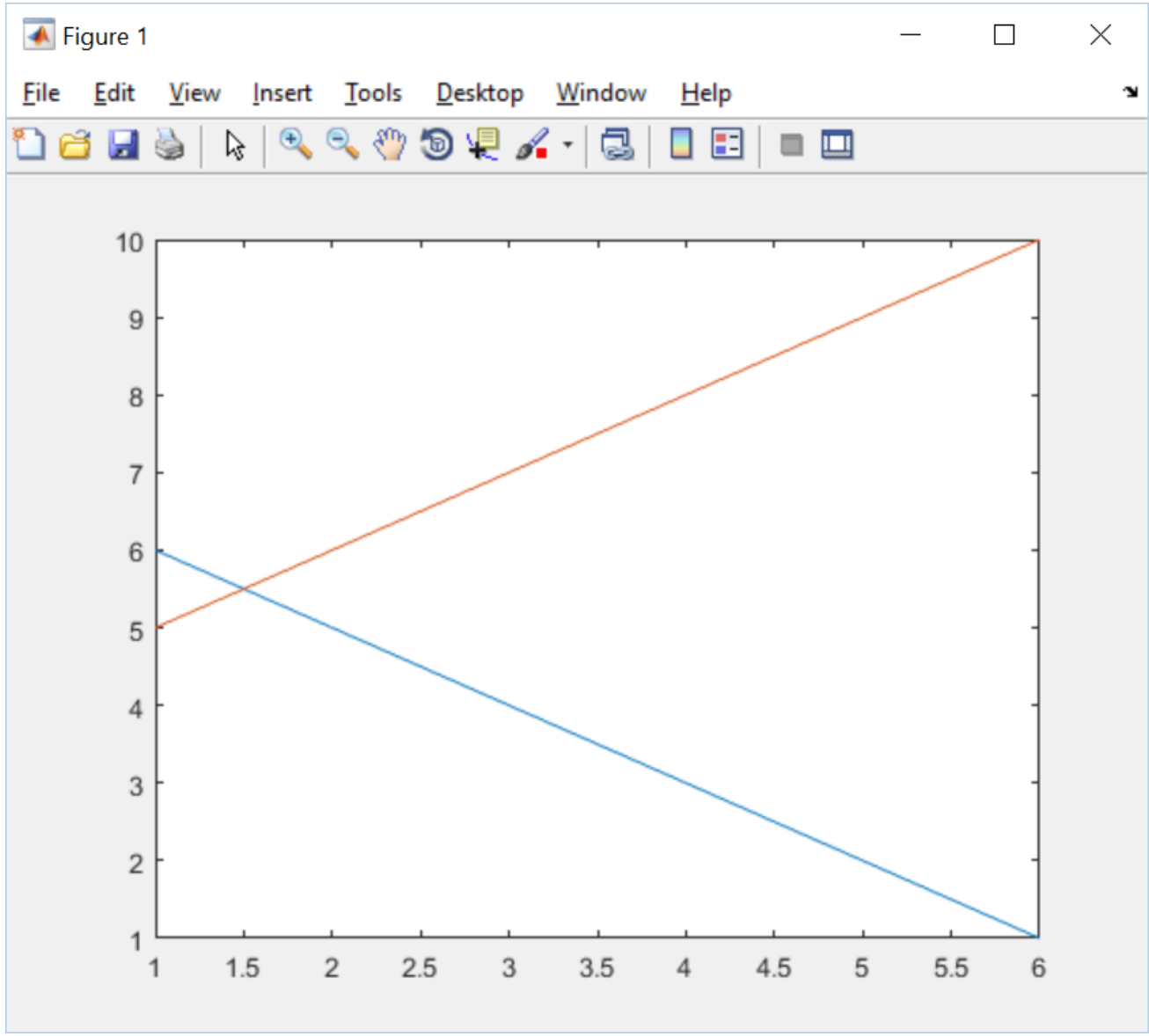
```
plot(a,b);
plot(a,c);
```



Plot multiple lines

```
% for loop
a = [1 2 3 4 5 6];
count = 0;
for i = 1:6
        count = count + a(i);
end
disp(count);
```

```
plot(a,b,a,c);
```

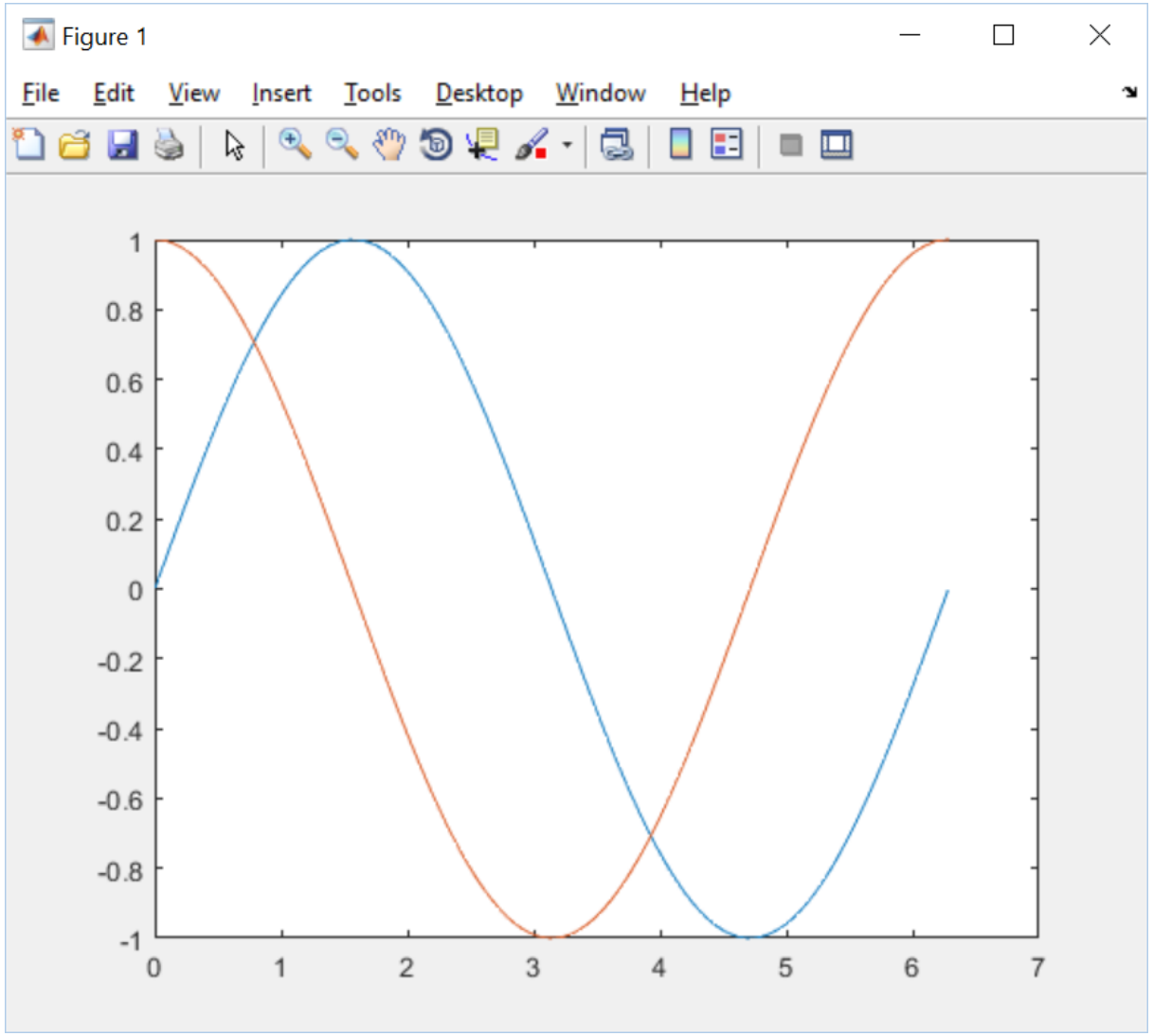


Comment the previous code

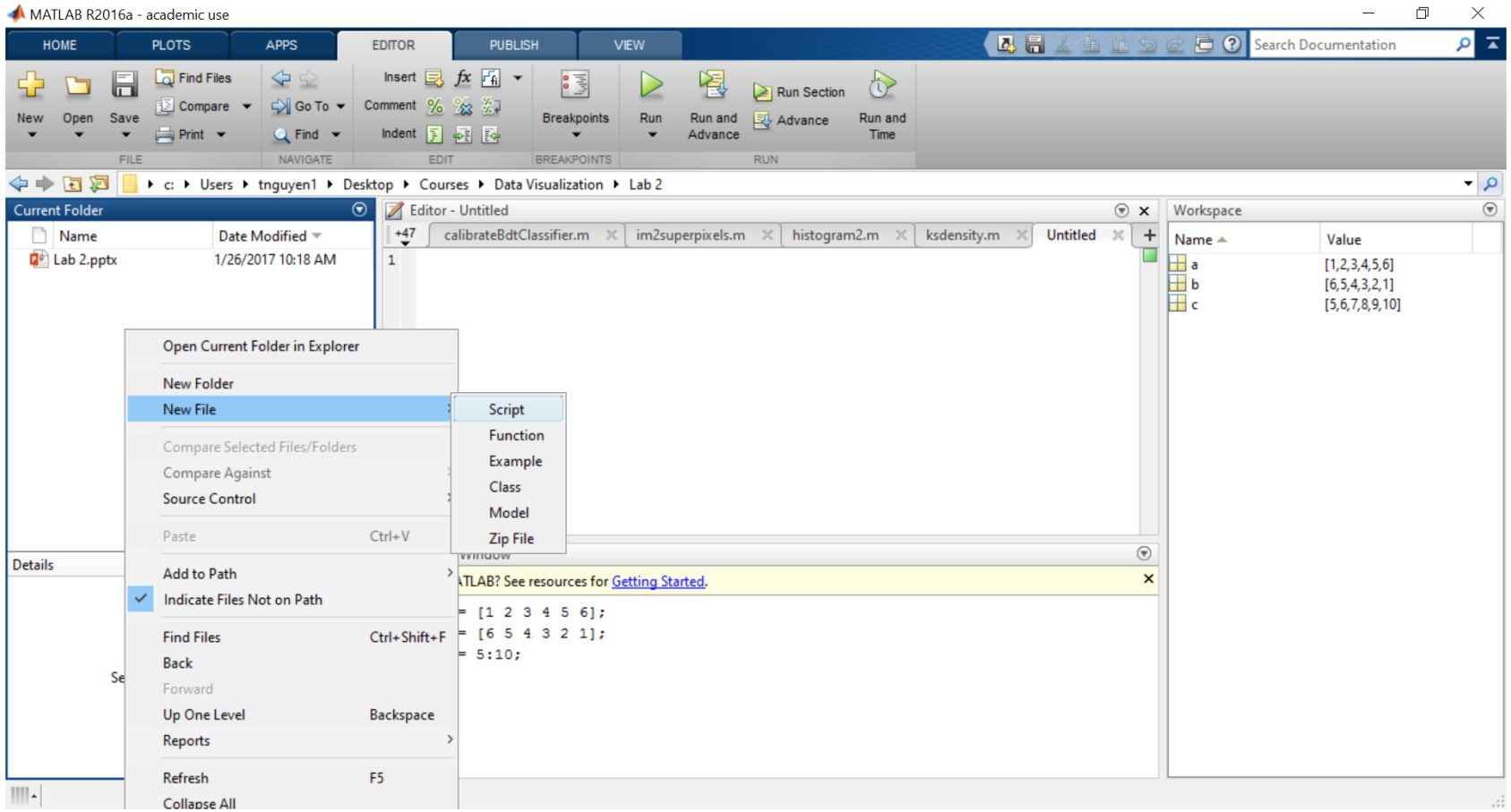
```
% a = [1 2 3 4 5 6];
% count = 0;
% for i = 1:6
%   count = count + a(i);
% end
% disp(count);

% plot(a,b,a,c);
```

Try different data

```
x = 0:pi/100:2*pi;
y1 = sin(x);
y2 = cos(x);
plot(x,y1,x,y2);
```



Create a new MATLAB script: Lab2b.m



Lab2b.m

```
clear all;
close all;
clc;
```

Input Precision and Recall

clear all;

close all;

clc;

Precision = [0.797009 0.815369 0.832162 0.820447 0.865443 0.86361 0.822107 0.818487 0.884089 0.786283 0.856924];

Recall = [0.846184 0.765644 0.818961 0.773621 0.821652 0.78193 0.828532 0.773323 0.74201 0.655659 0.817653];

Recall: F-measure Computation

$$F = 2 \cdot \frac{1}{\frac{1}{\text{recall}} + \frac{1}{\text{precision}}} = 2 \cdot \frac{\text{precision} \cdot \text{recall}}{\text{precision} + \text{recall}}$$

Compute FMeasure

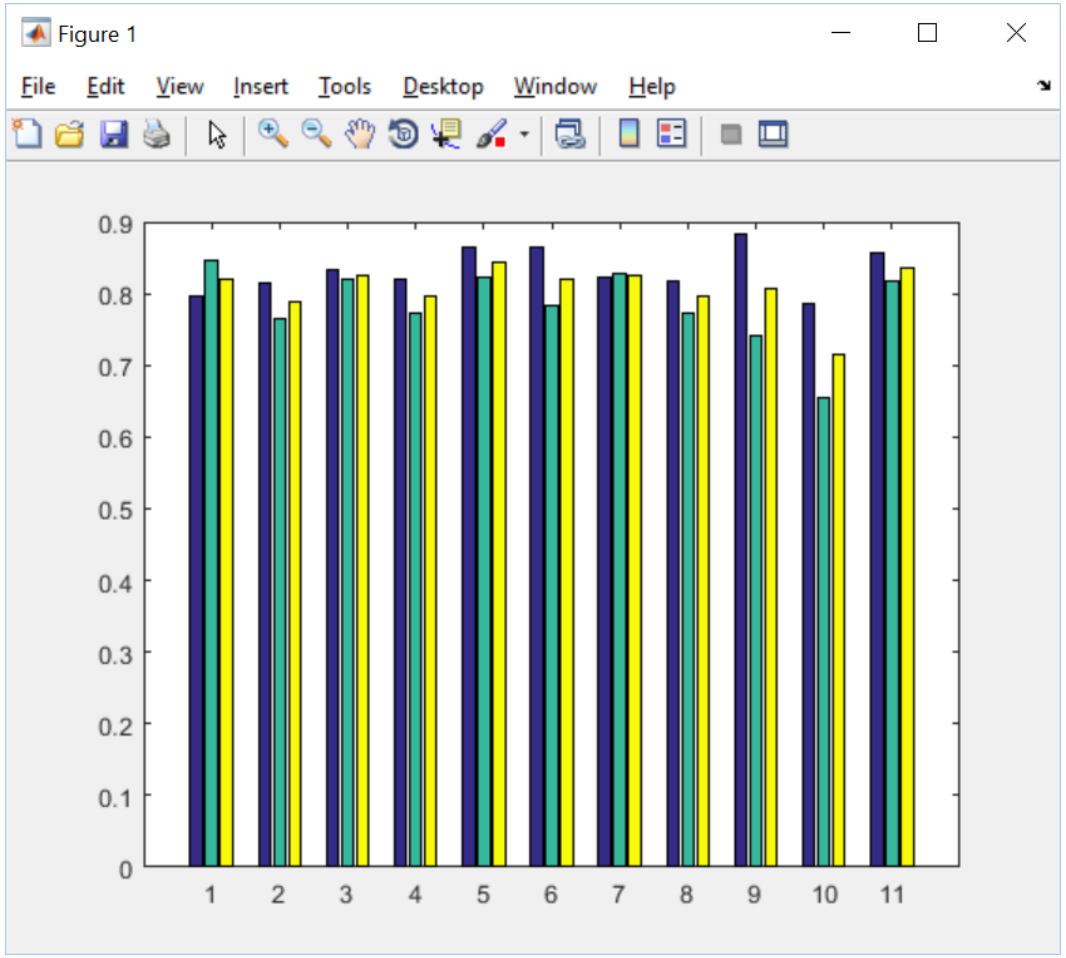
Precision = [0.797009 0.815369 0.832162 0.820447 0.865443 0.86361 0.822107 0.818487 0.884089 0.786283 0.856924];

Recall = [0.846184 0.765644 0.818961 0.773621 0.821652 0.78193 0.828532 0.773323 0.74201 0.655659 0.817653];

FMeasure = 2*(Precision.*Recall)./(Precision + Recall);

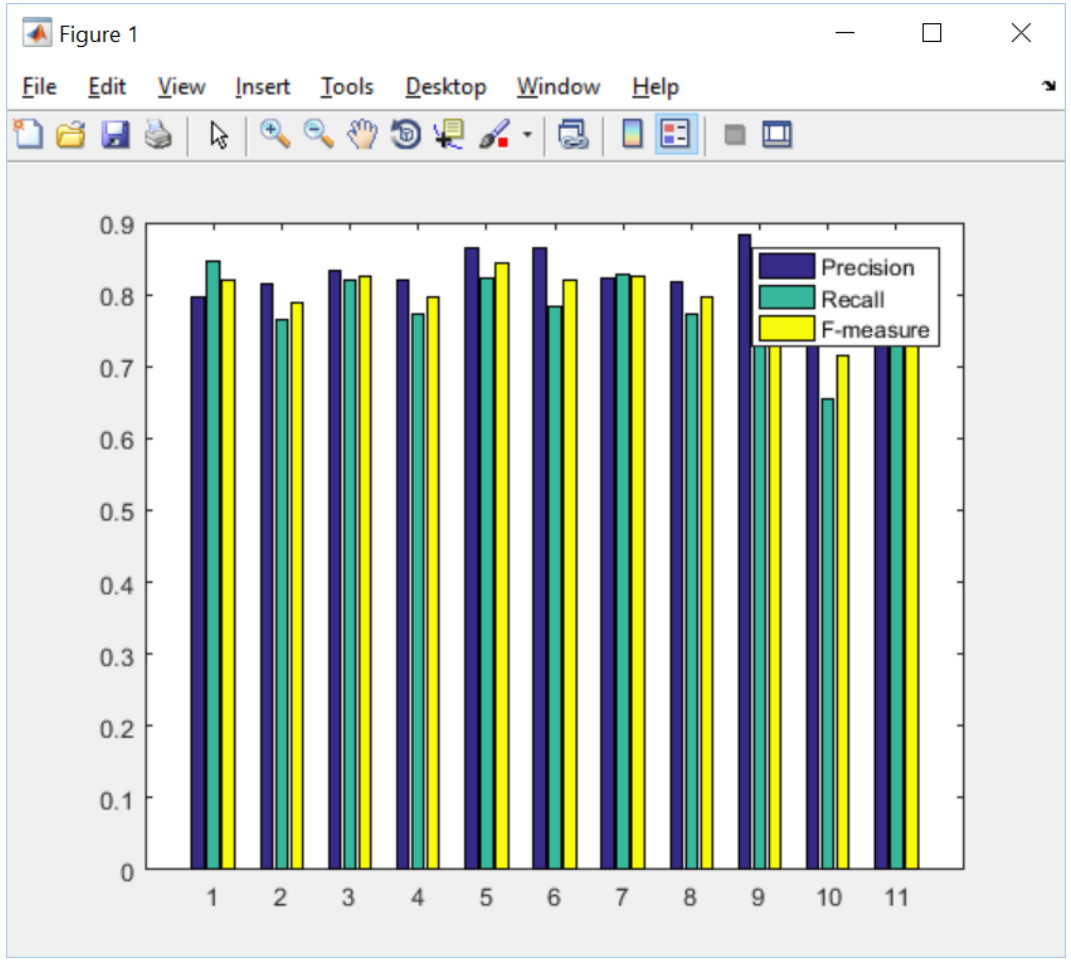
Plot the bar chart

```
FMeasure =
2*(Precision.*Recall)./(Precision +
Recall);

bar([Precision; Recall; FMeasure]');
```



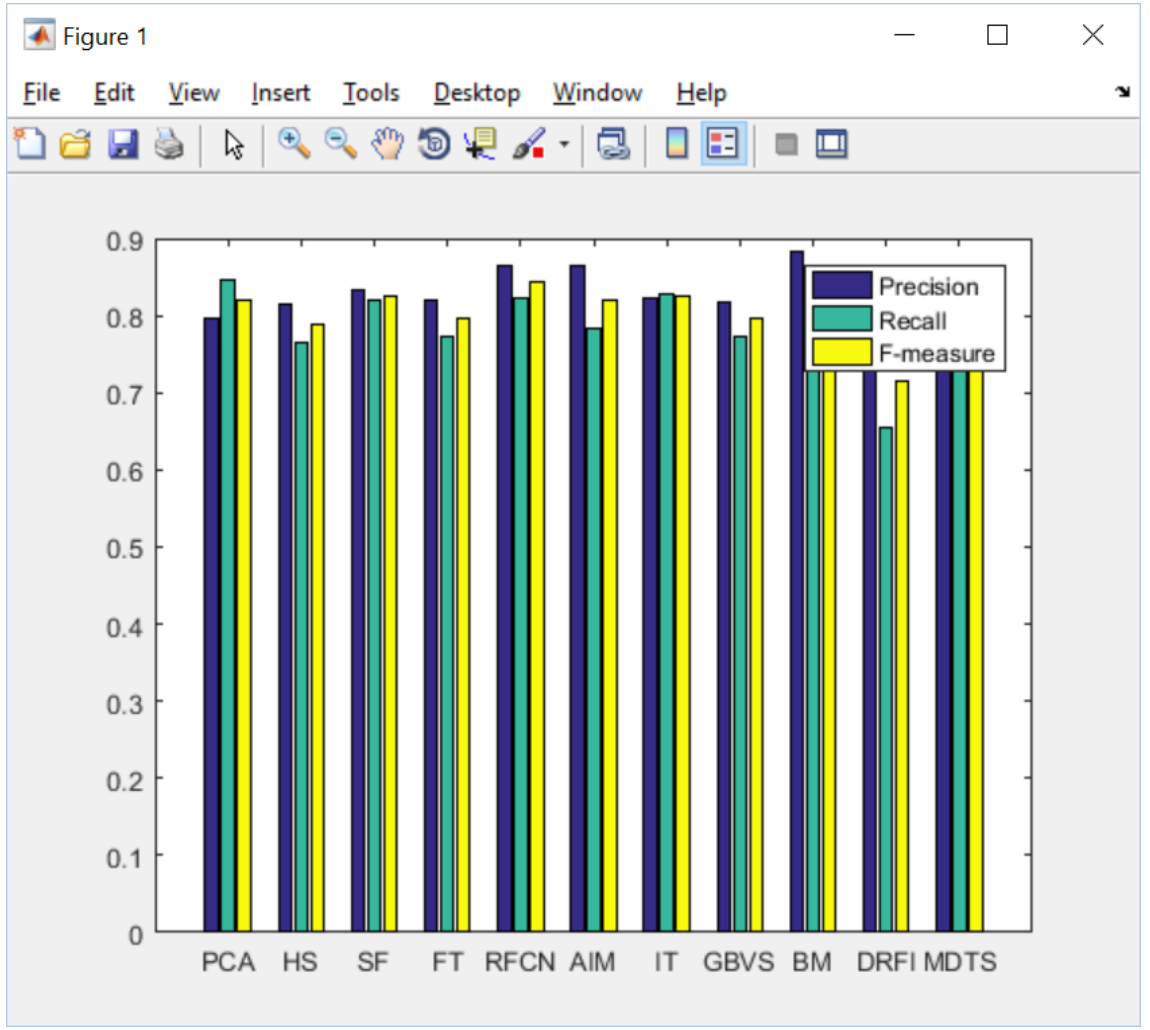
Add the legend

```
FMeasure = 2*(Precision.*Recall)./(Precision + Recall);

bar([Precision; Recall; FMeasure]');

legend('Precision', 'Recall', 'F-measure');
```



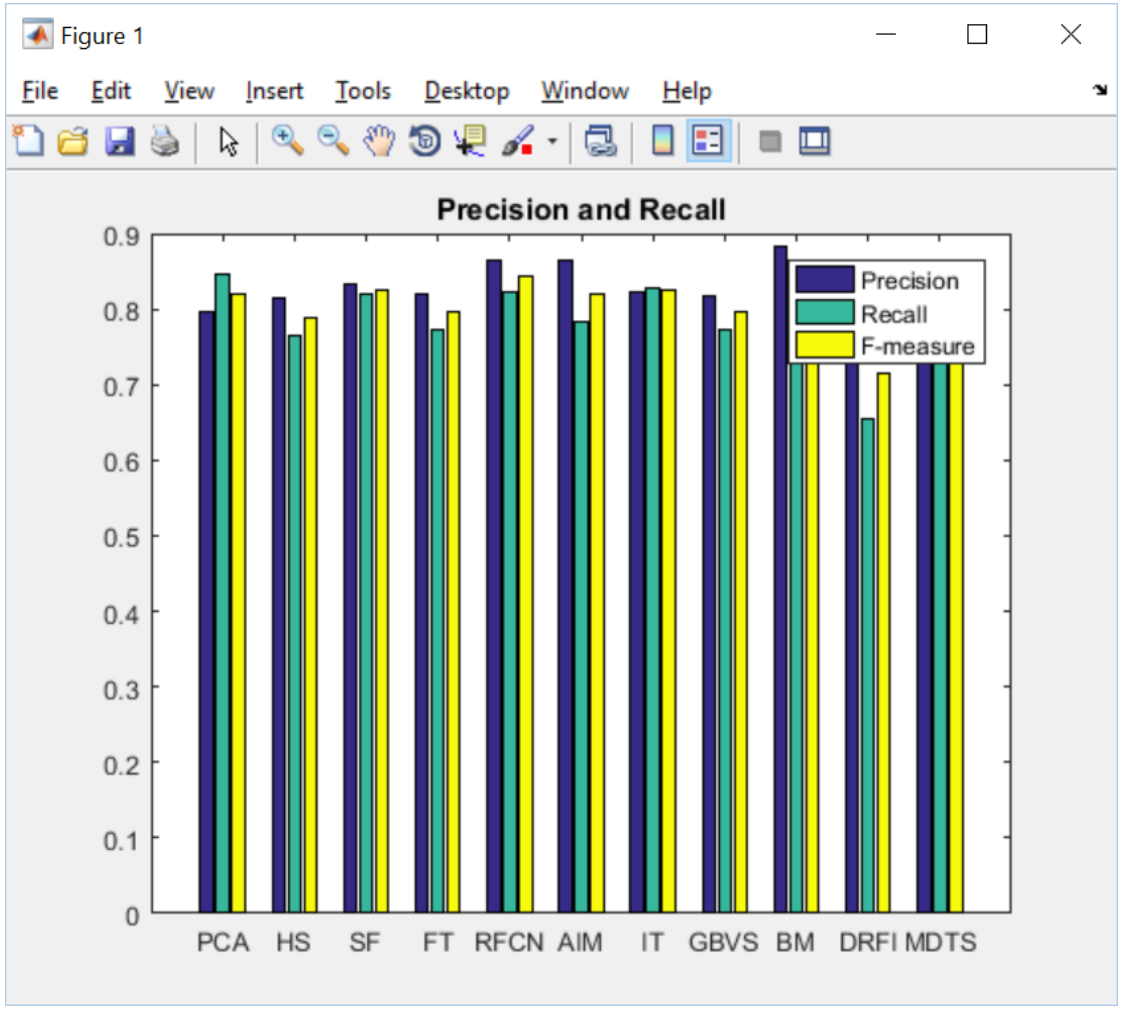
Add the labels

```
legend('Precision', 'Recall', 'F-measure');

set(gca, 'XTickLabel', {'PCA', 'HS', 'SF', 'FT', 'RFCN', 'AIM', 'IT', 'GBVS', 'BM', 'DRFI', 'MDTS'});
```



Add the title

```
legend('Precision', 'Recall', 'F-measure');

set(gca, 'XTickLabel', {'PCA', 'HS', 'SF', 'FT', 'RFCN', 'AIM', 'IT', 'GBVS', 'BM', 'DRFI', 'MDTS'});

title('Precision and Recall');
```



Q&A