University of Dayton

Lab 3

CPS 563 – Data Visualization

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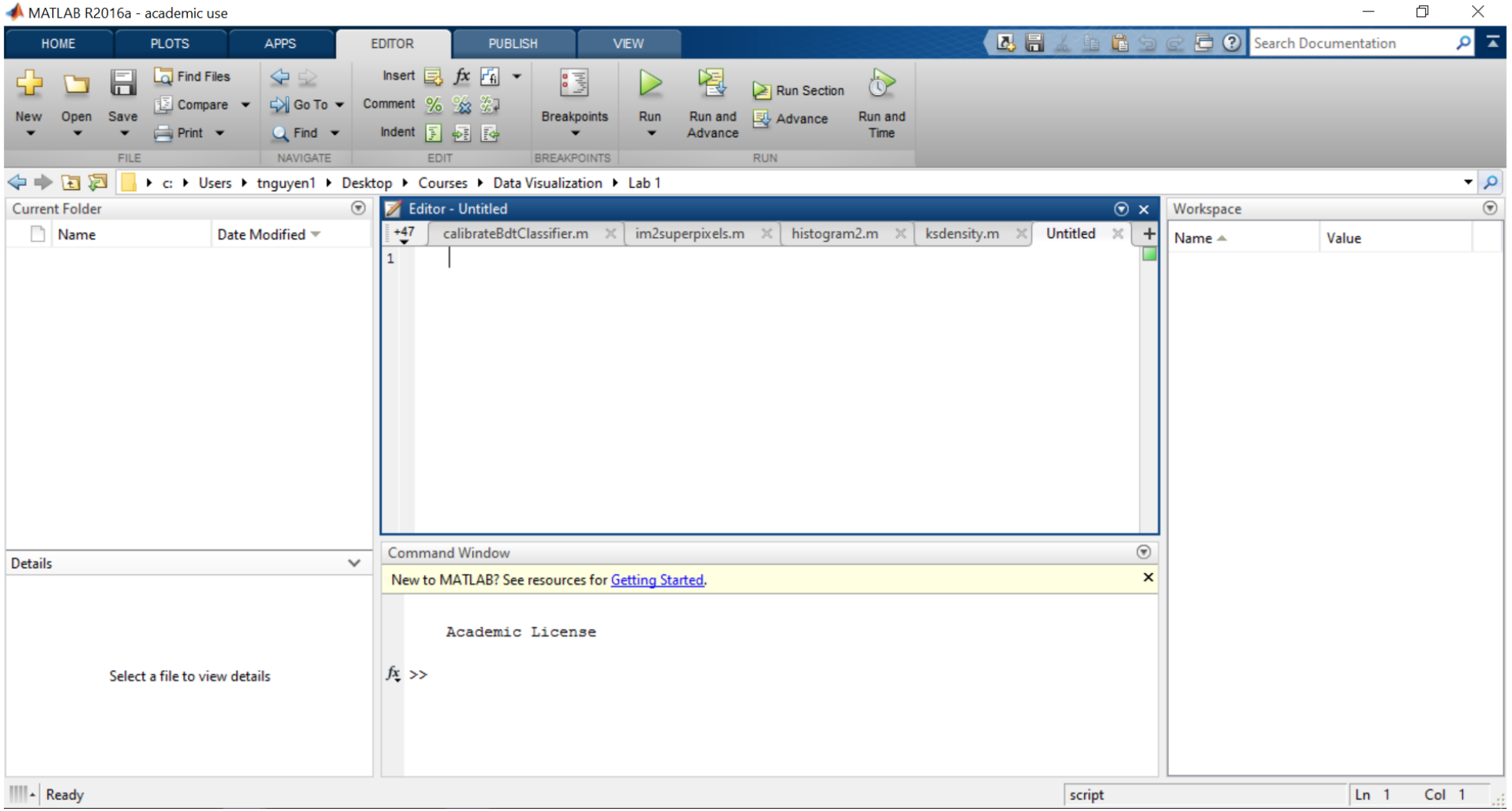
Outline

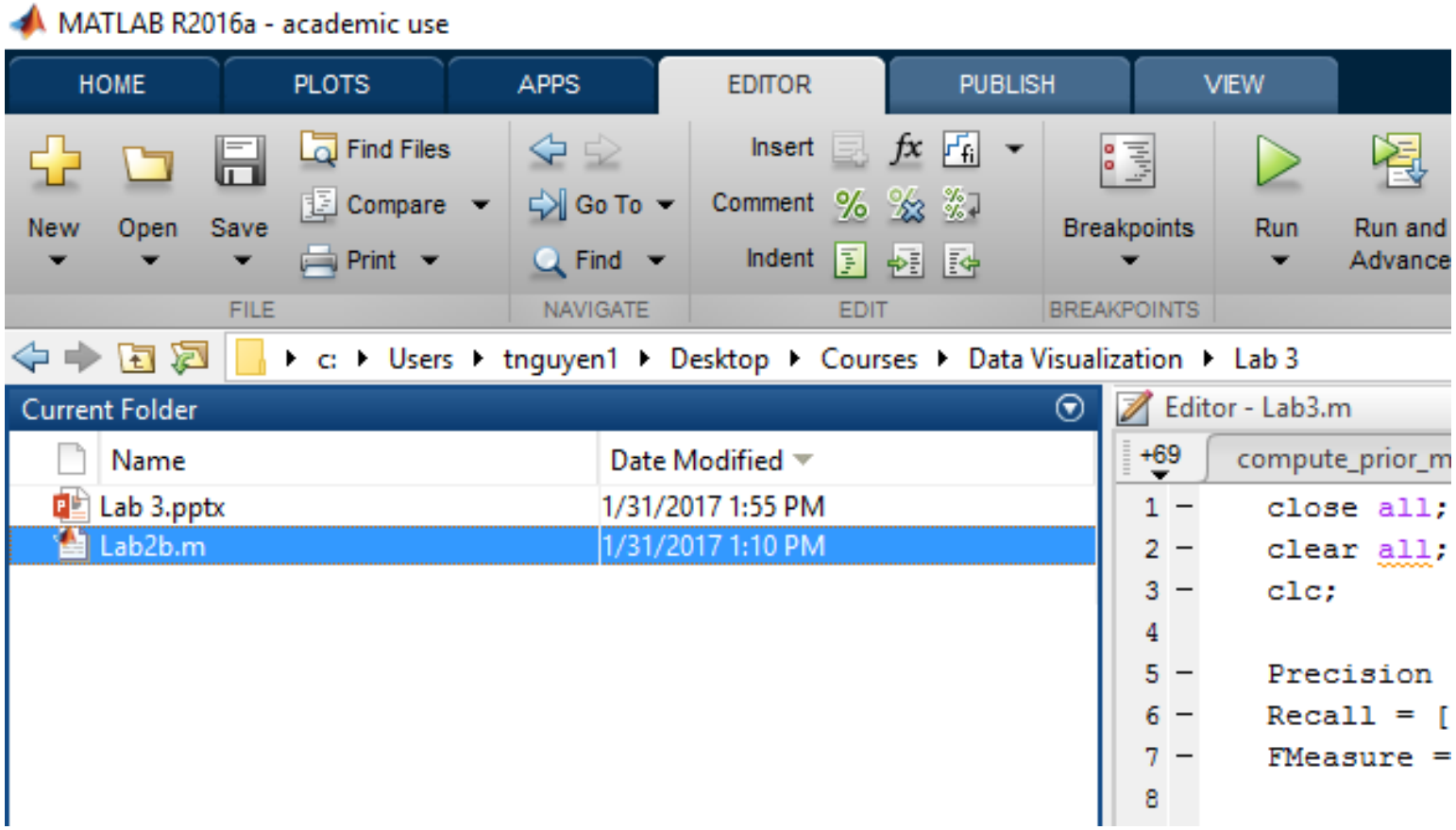
- Create and use function in MATLAB
- Modify the bar chart

Start MATLAB



Create Lab 3 folder

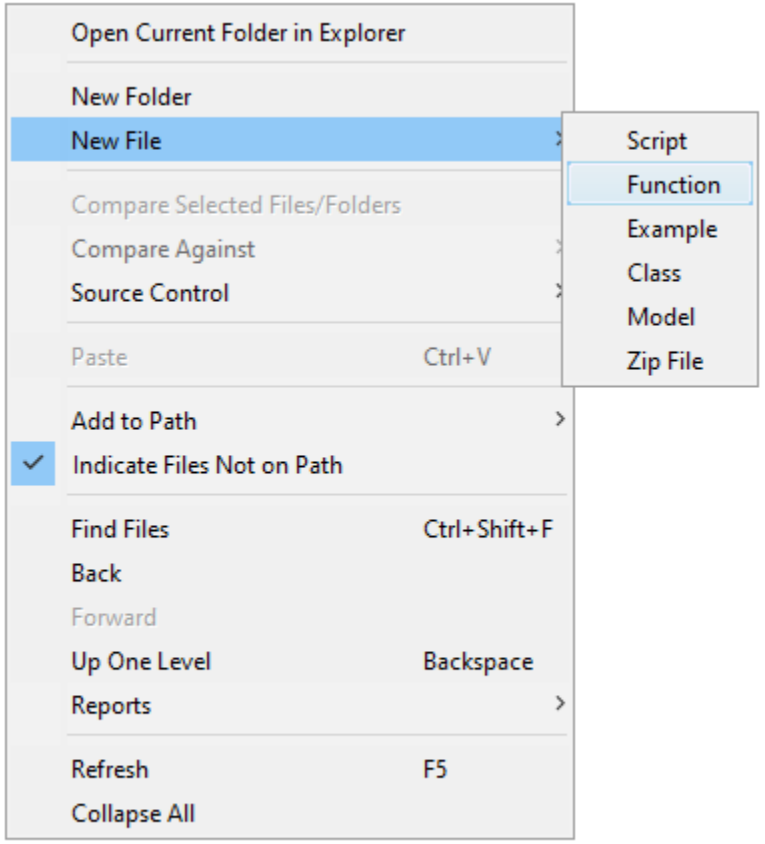
- Copy Lab2b.m into Lab 3 folder



Lab2b.m

```
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);

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

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

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

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

Create new function file: createBarChart



Open createBarChart.m

```
function [ output_args ] = createBarChart( input_args )
%CREATEBARCHART Summary of this function goes here
%   Detailed explanation goes here


end
```

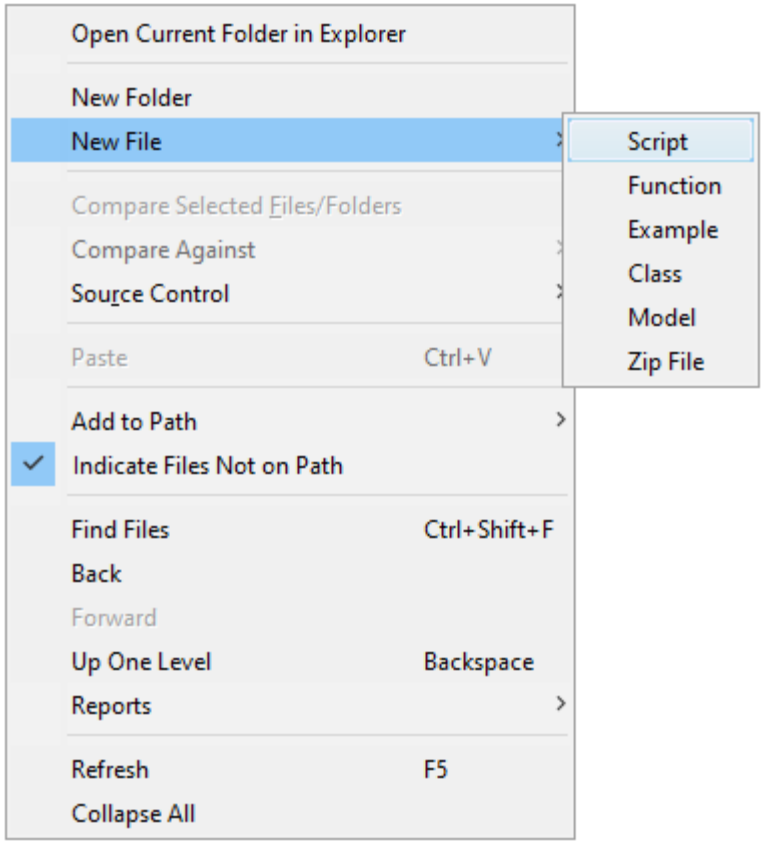
Update the output and the inputs

```
function createBarChart( data, methods, legends, chart_title )
%CREATEBARCHART Summary of this function goes here
%   Detailed explanation goes here


end
```

Implement the function

```
function createBarChart( data, methods, legends, chart_title )
%CREATEBARCHART Summary of this function goes here
%   Detailed explanation goes here
bar(data);
legend(legends);
set(gca, 'XTickLabel', methods);
title(chart_title);
end
```

Create new script file: Lab3.m



Open Lab3.m

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

Update Lab3.m

close all;

clear 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];

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

Prepare the inputs

```
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);
```

```
data = [Precision; Recall; FMeasure]';
methods = {'PCA', 'HS', 'SF', 'FT', 'RFCN', 'AIM', 'IT', 'GBVS', 'BM', 'DRFI',
'MDTS'};
chart_title = 'Precision and Recall';
legends = {'Precision', 'Recall', 'F-measure'};
```

Call the newly created function

```
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);

data = [Precision; Recall; FMeasure]';
methods = {'PCA', 'HS', 'SF', 'FT', 'RFCN', 'AIM', 'IT', 'GBVS', 'BM', 'DRFI', 'MDTS'};
chart_title = 'Precision and Recall';
legends = {'Precision', 'Recall', 'F-measure'};

createBarChart( data, methods, legends, chart_title);
```

Run Lab3.m

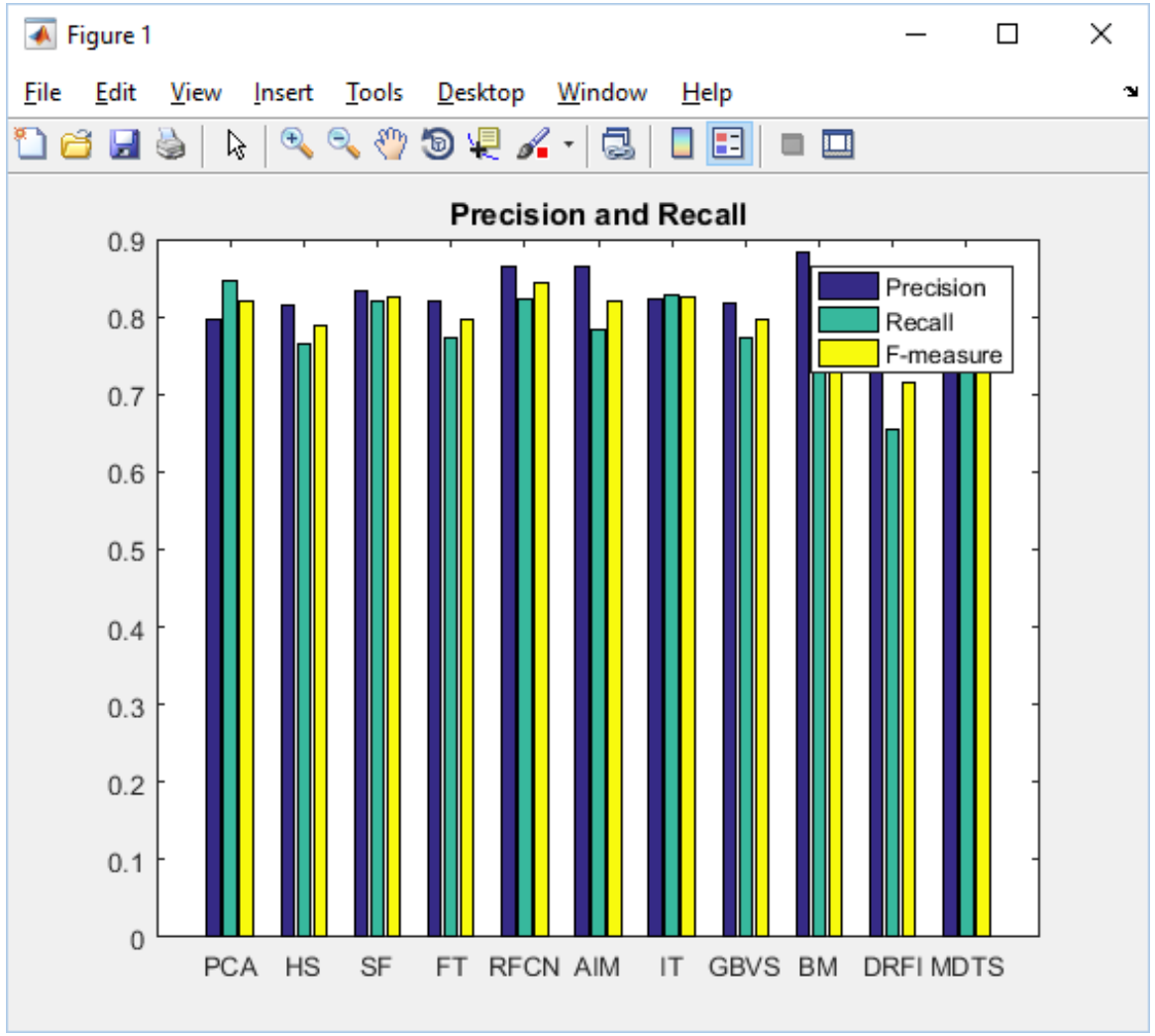
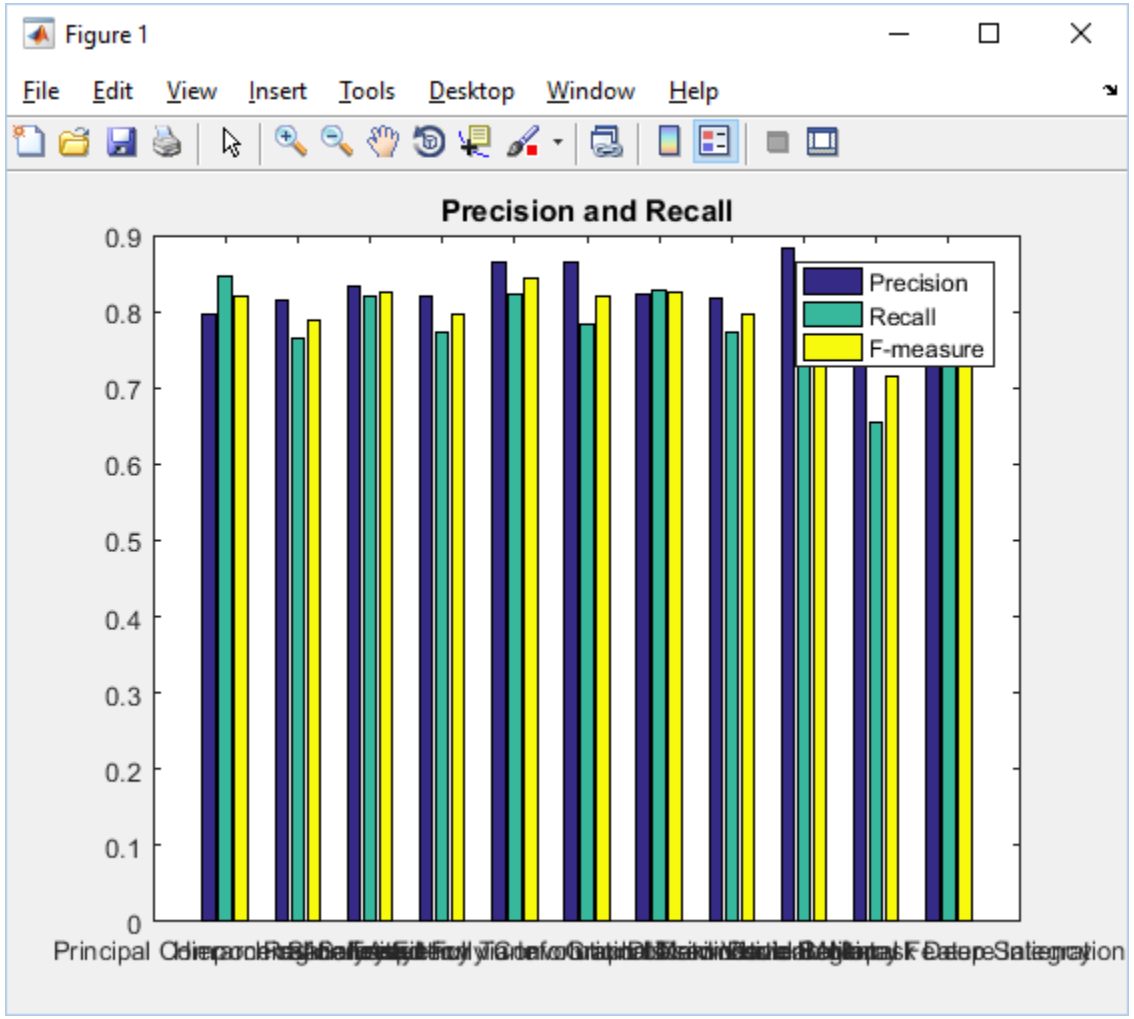


Figure 1
File Edit View Insert Tools Desktop Window Help
Precision and Recall
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Precision
Recall
F-measure
PCA HS SF FT RFCN AIM IT GBVS BM DRFI MDTS

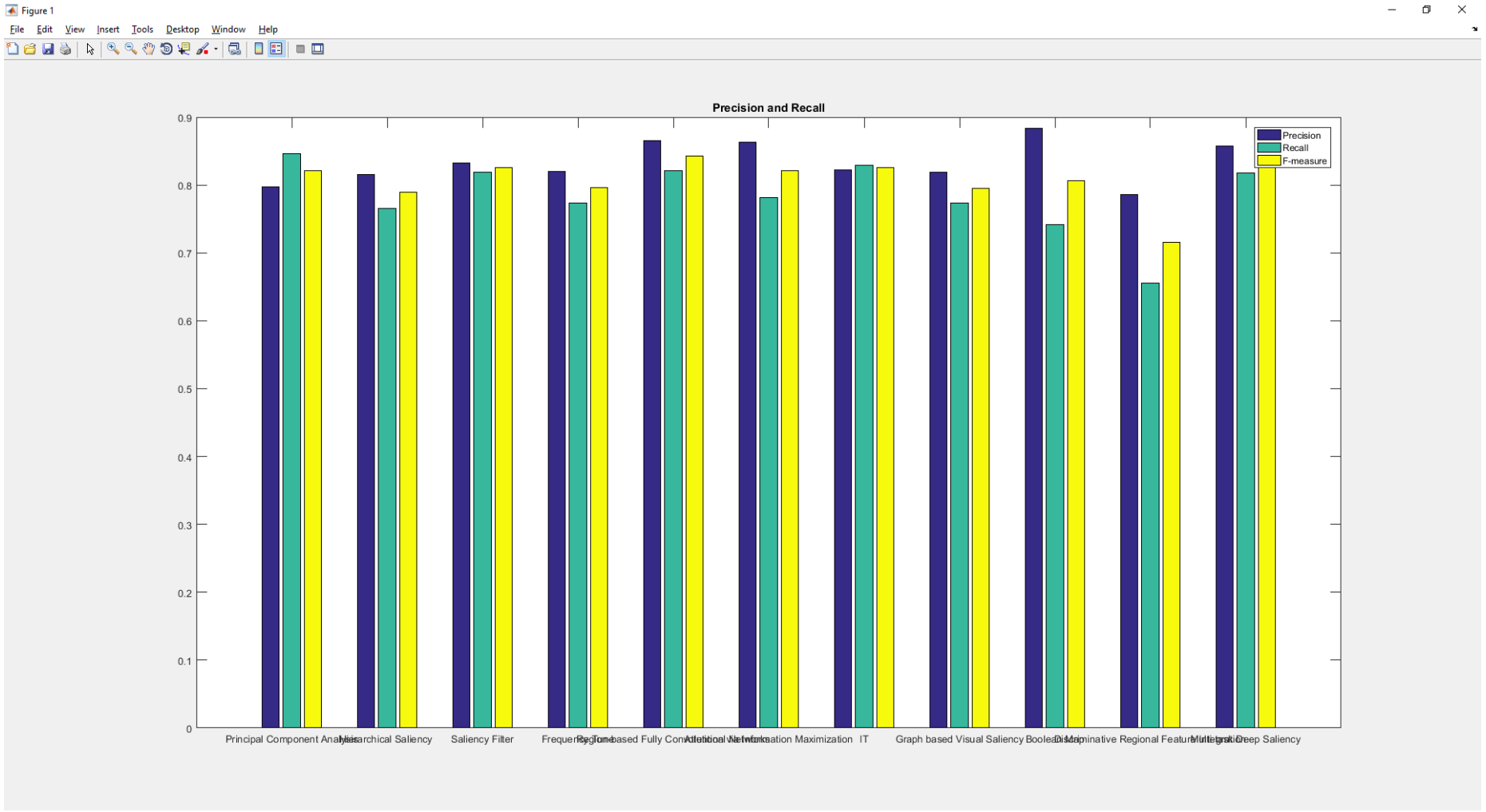
Update the methods' names

```
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);


data = [Precision; Recall; FMeasure]';
% methods = {'PCA', 'HS', 'SF', 'FT', 'RFCN', 'AIM', 'IT', 'GBVS', 'BM', 'DRFI', 'MDTS'};
methods = {'Principal Component Analysis', 'Hierarchical Saliency ', 'Saliency Filter', 'Frequency Tune', 'Region-
based Fully Convolutional Networks', 'Attention via Information Maximization', 'IT', 'Graph based Visual
Saliency', 'Boolean Map', 'Discriminative Regional Feature Integration', 'Multi-task Deep Saliency'};
chart_title = 'Precision and Recall';

legends = {'Precision', 'Recall', 'F-measure'};

createBarChart( data, methods, legends, chart_title);
```

Run Lab3.m again



Maximize the window



Update createBarChart.m

```
function createBarChart( data, methods, legends, chart_title )
%CREATEBARCHART Summary of this function goes here
%   Detailed explanation goes here
bar(data);
legend(legends);
set(gca, 'XTickLabel', methods);
title(chart_title);
h = gca;
h.XTickLabelRotation = 60;
end
```

Run Lab3.m

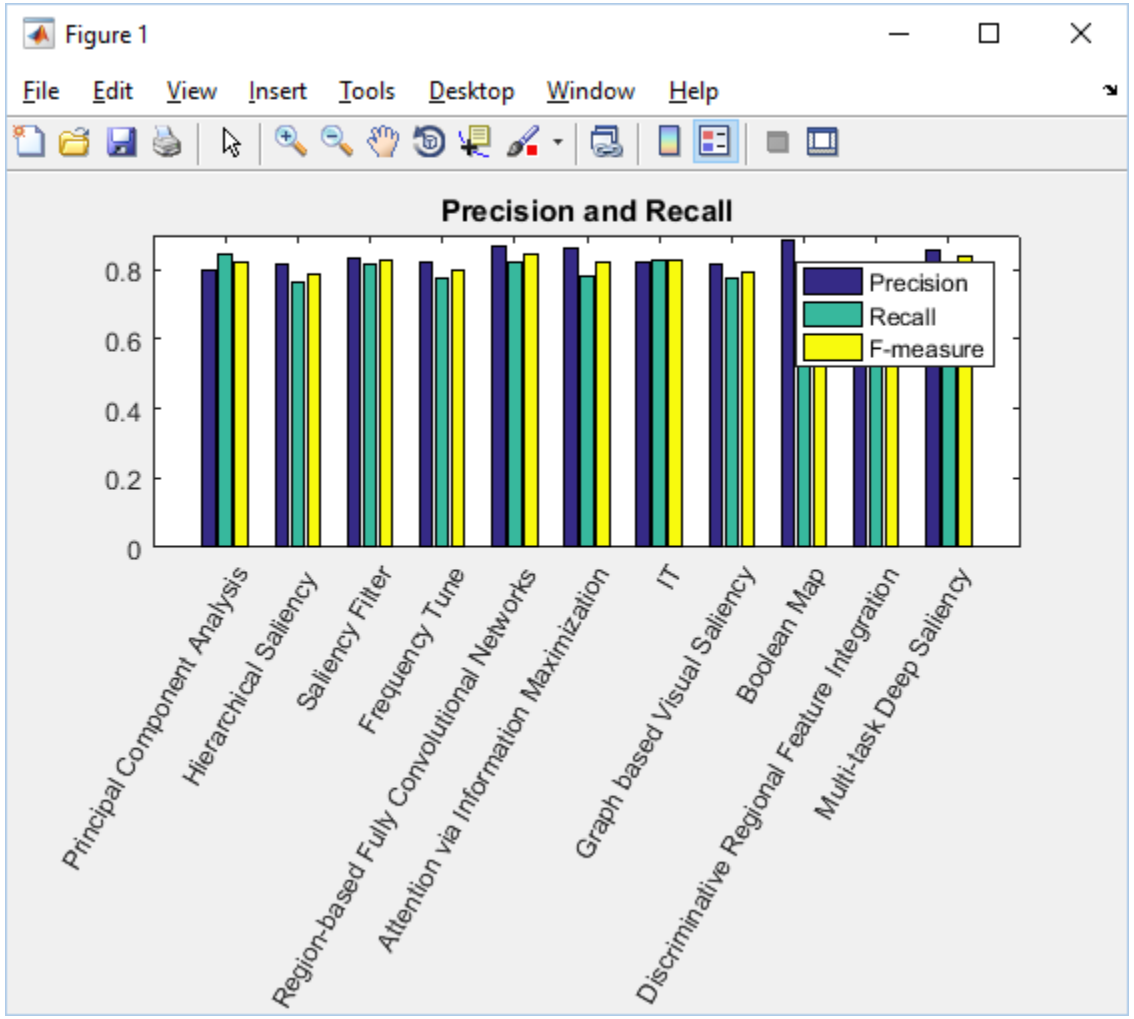


Figure 1
File Edit View Insert Tools Desktop Window Help
Precision and Recall
0.8
0.6
0.4
0.2
0
Precision
Recall
F-measure
Principal Component Analysis
Hierarchical Saliency
Saliency Filter
Frequency Tune
Region-based Fully Convolutional Networks
Attention via Information Maximization
IT
Graph based Visual Saliency
Boolean Map
Discriminative Regional Feature Integration
Multi-task Deep Saliency

Highlight the F-Measure: update createBarChart.m

```
function b = createBarChart( data, methods, legends, chart_title )
%CREATEBARCHART Summary of this function goes here
%   Detailed explanation goes here
b = bar(data);
legend(legends);
set(gca, 'XTickLabel', methods);
title(chart_title);
h = gca;
h.XTickLabelRotation = 60;
end
```

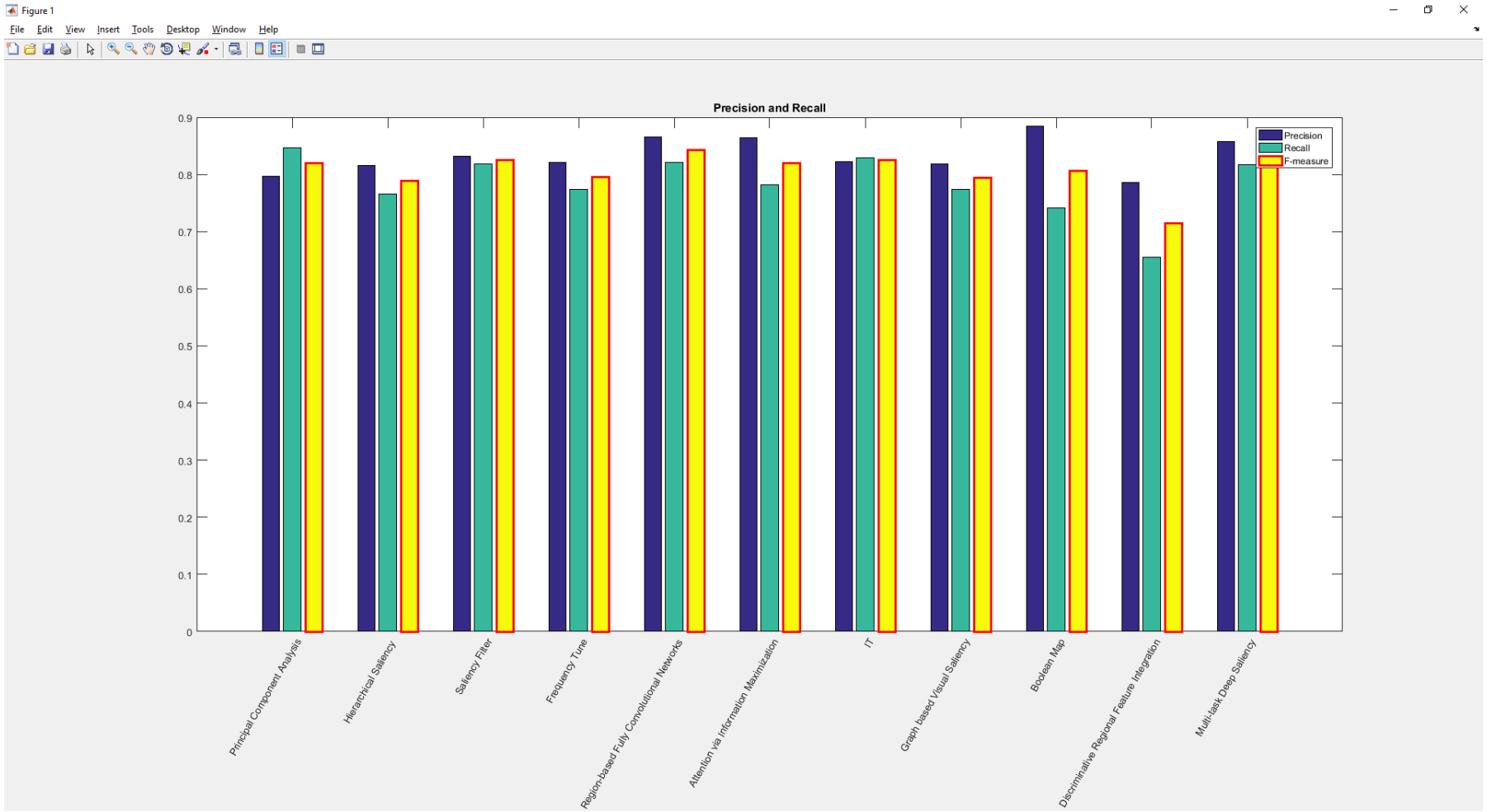
Update Lab3.m

```
Precision = [0.79700 0.815369 0.83216 0.820447 0.86544 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);


data = [Precision; Recall; FMeasure]';

methods = {'Principal Component Analysis', 'Hierarchical Saliency ', 'Saliency Filter', 'Frequency Tune', 'Region-based Fully Convolutional Networks', 'Attention via Information Maximization', 'IT', 'Graph based Visual Saliency', 'Boolean Map', 'Discriminative Regional Feature Integration', 'Multi-task Deep Saliency'};

chart_title = 'Precision and Recall';

legends = {'Precision', 'Recall', 'F-measure'};


b = createBarChart( data, methods, legends, chart_title);

b(3).LineWidth = 2;

b(3).EdgeColor = 'red';
```

Color in MATLAB charts

Long Name	Short Name	RGB Triplet
'yellow'	'y'	[1 1 0]
'magenta'	'm'	[1 0 1]
'cyan'	'c'	[0 1 1]
'red'	'r'	[1 0 0]
'green'	'g'	[0 1 0]
'blue'	'b'	[0 0 1]
'white'	'w'	[1 1 1]
'black'	'k'	[0 0 0]

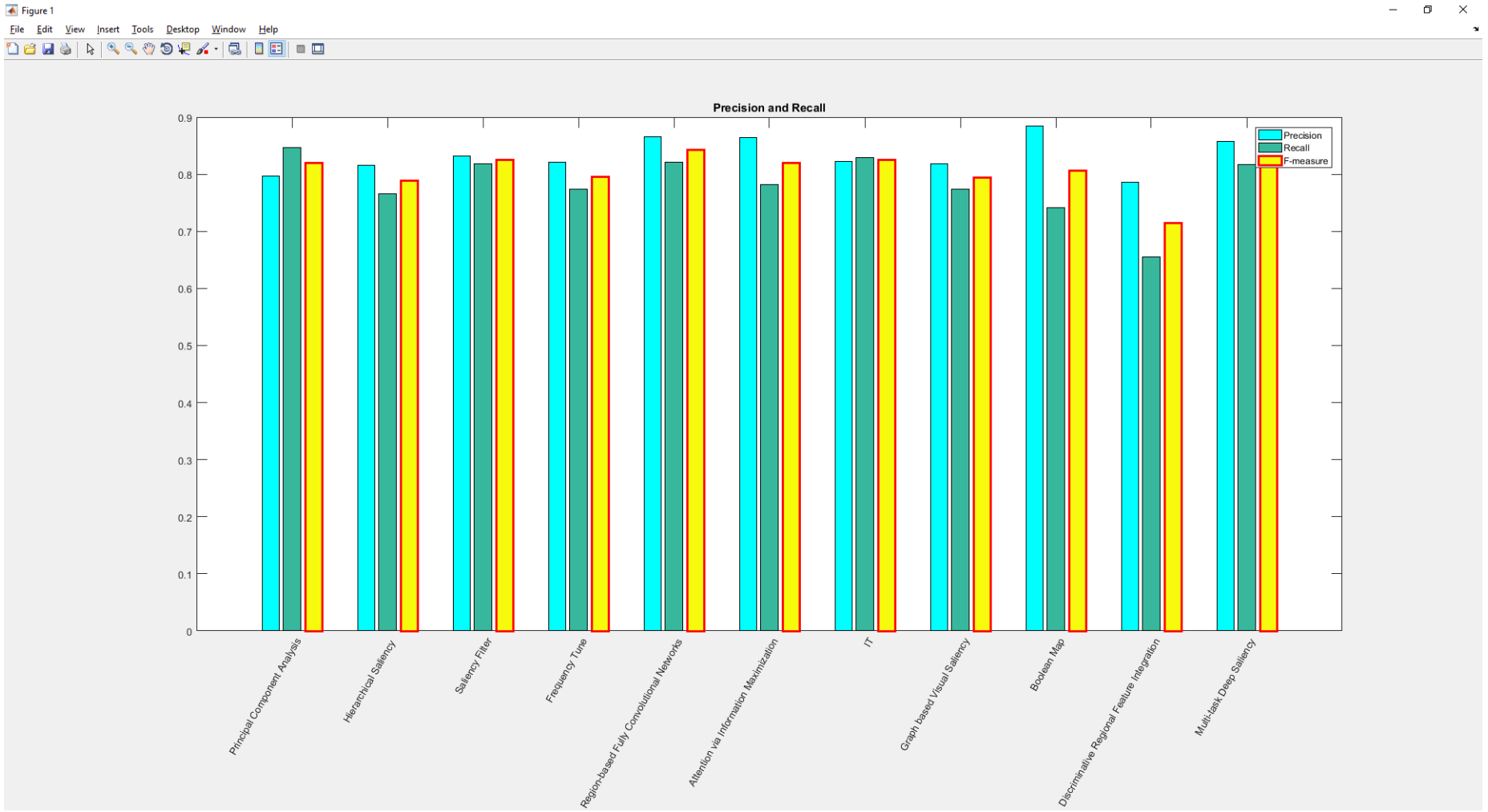
Run Lab3.m again



Change the bar color (Lab3.m)

```
b = createBarChart( data, methods, legends, chart_title);
b(3).LineWidth = 2;
b(3).EdgeColor = 'red';

b(1).FaceColor = 'cyan';
```

Run Lab3.m again



Q&A