Review of Lecture 11

- **2D plot**

  `plot (X, Y)`

```
>> plot(X, Y, 'r--o');
>> xlabel('x value');
>> ylabel('y = sqrt (x)');
>> title('Plot of root square function');
```

- **Plotting Multiple Plots on the Same Graph**

  `plot(X1,Y1,...,Xn,Yn)`

```
>> plot(X, Y1,'r', X, Y2,'go', X, Y3, 'b--*');
...
>> legend(' y1', ' y2',' y3');
```

To add new plots to existing one : **`hold on`**
To turn off the addition of the plots : **`hold off`**

- **Plotting Multiple Plots in Separate views**

  `subplot(row,coloumn,position)`

```
>> figure
>> subplot(2,1,1);
>> plot(X, Y1);
>> title('SubPlot 1 : y1');
>> subplot(2,1,2);
>> plot(X, Y2);
>> title('SubPlot 2 : y2');
```

Info 3

Introduction to MATLAB

M. Bouzenita
2nd year Engineer - University of Jijel

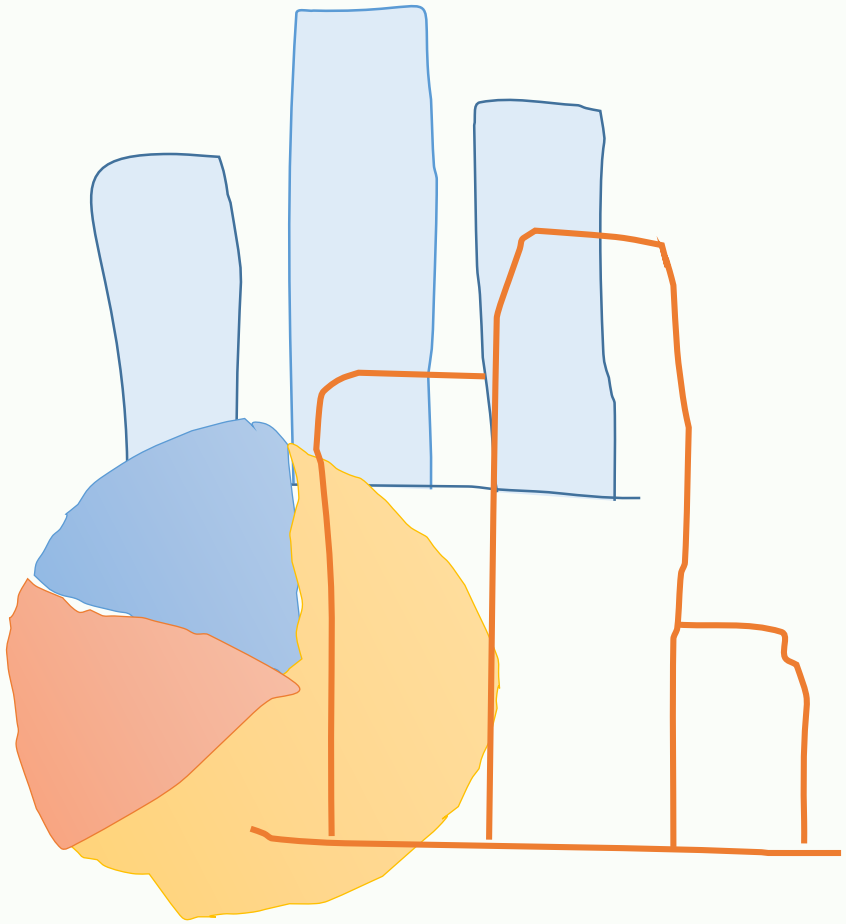
Lecture 12

Graphics in MATLAB(2/2)

1. Other specialized 2D plots

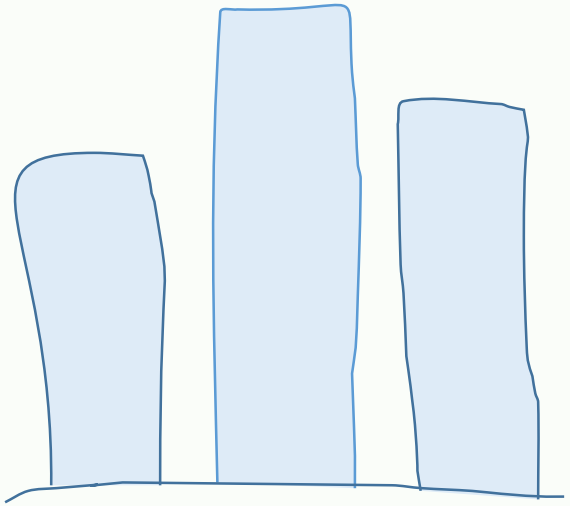
MATLAB offers several specialized 2D plots including: **Bar charts, histograms, area, stem**...

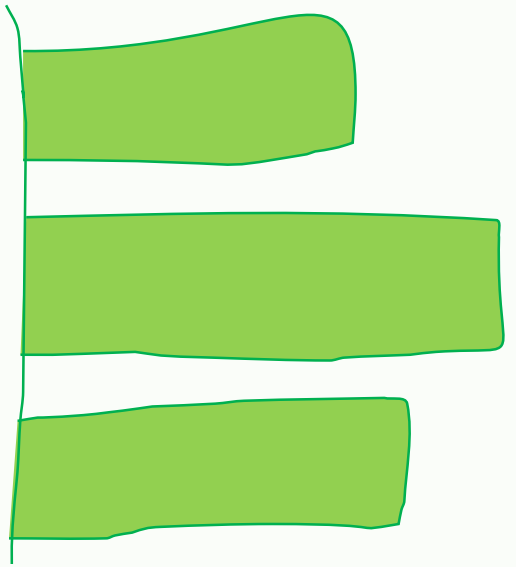
```
bar()
barh()
histogram()
pie()
```



1. Other specialized 2D plots

`bar()` and `barh()`





These functions display data in bar charts :

`bar()`: draws vertical bars.

`barh()` draws data in horizontal bars

1. Other specialized 2

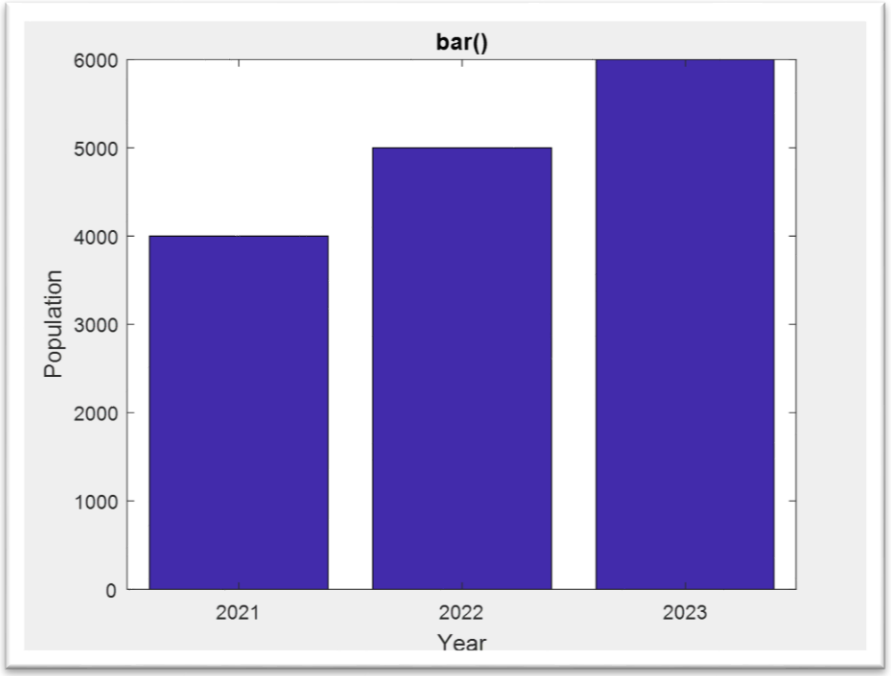
bar() and barh()

These functions display data in bar charts :

bar(): draws vertical bars.

barh() draws data in horizontal bars

```
>> % Vertical bar : bar()
>> Y = 2021:2023;
>> Pop = [4000, 5000, 6000];
>> figure
>> bar(Y, Pop);
>> xlabel('Year');
>> ylabel('Population');
>> title('bar()');
```



1. Other specialized 2

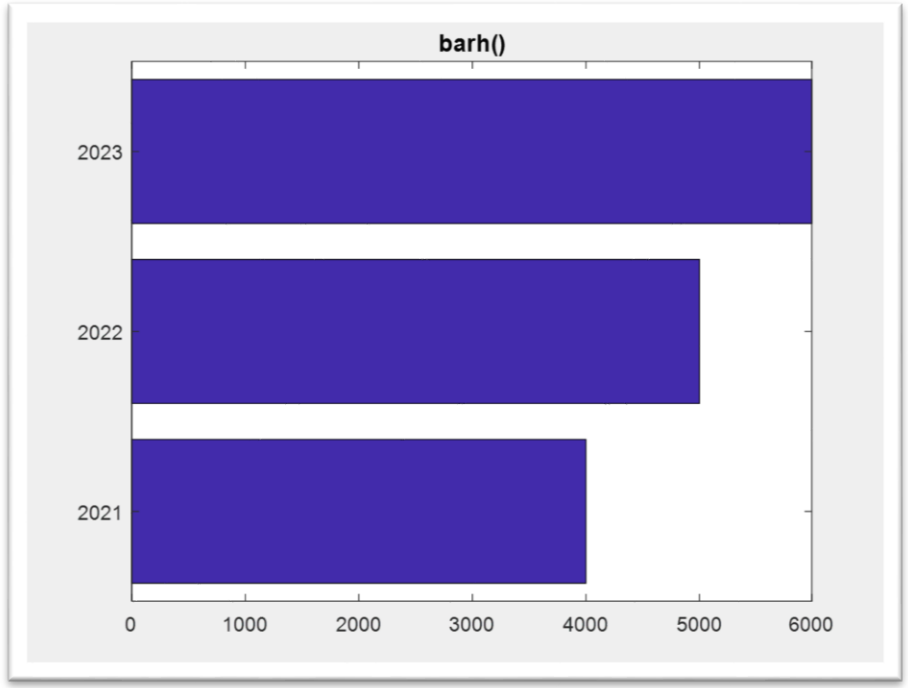
`bar()` and `barh()`

These functions display data in bar charts :

`bar()`: draws vertical bars.

`barh()` draws data in horizontal bars

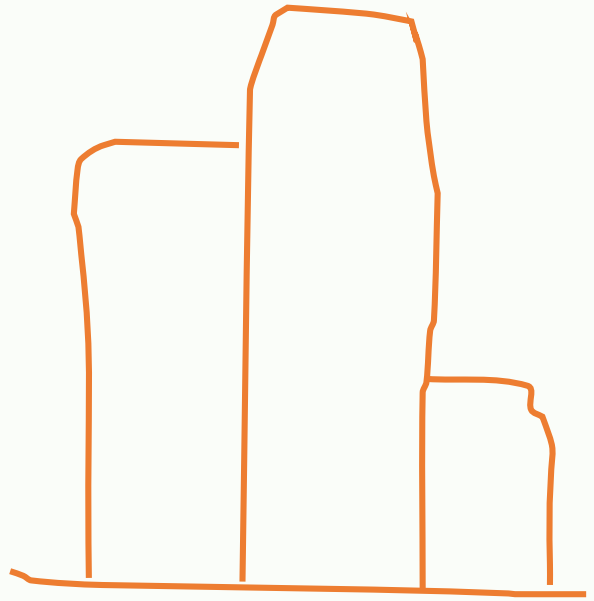
```
>> % horizontal bar : barh()
>> Y = 2021:2023;
>> Pop = [4000, 5000, 6000];
>> figure
>> barh(Y, Pop);
>> xlabel('Year');
>> ylabel('Population');
>> title('barh()');
```



1. Other specialized 2D plots

`Histogram()`

`histogram()` is a particular type of bar chart illustrating the frequency of occurrence of values in a vector.

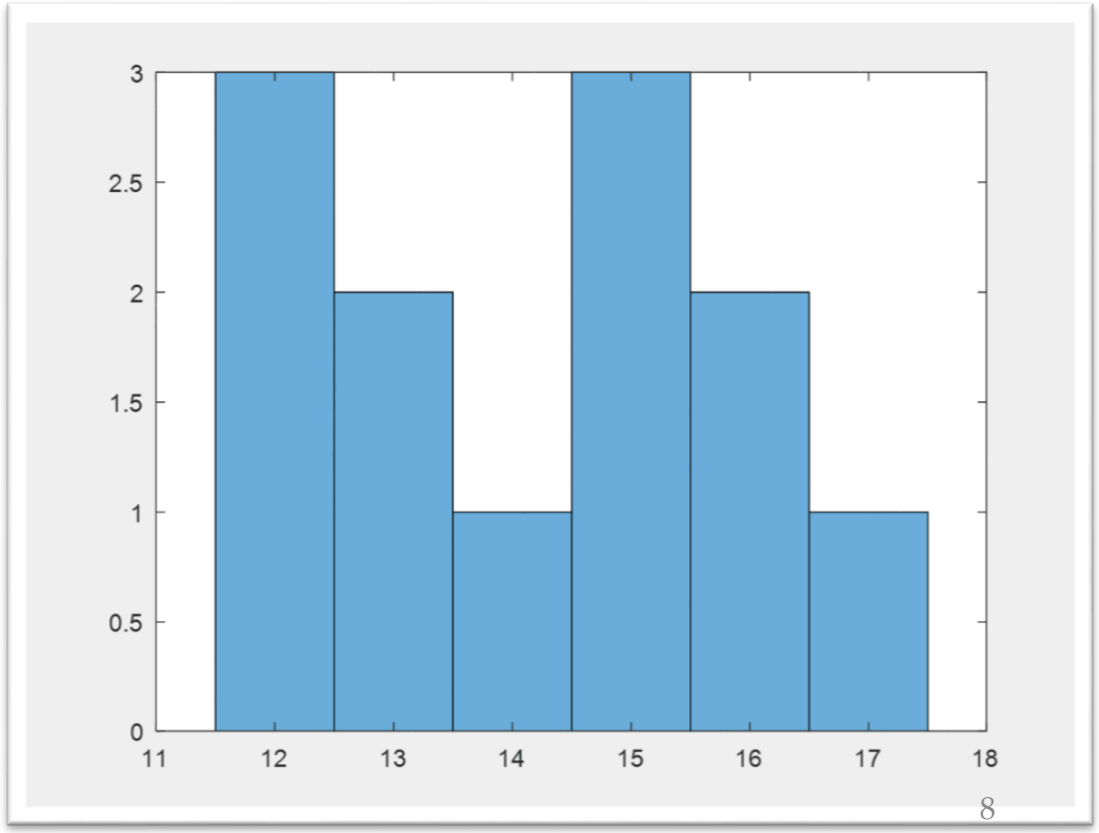


1. Other specialized

histogram

histogram() is a particular type of bar chart illustrating the frequency of occurrence of values in a vector.

```
data = [15, 12, 13, 13, 16, 17, 15, 12, 14, 12, 15, 16];

figure

histogram(data);

title('Distribution of Exam scores');

xlabel('Score Ranges');

ylabel('Number of students');
```



1. Other specialized

histogram

histogram() is a particular type of bar chart illustrating the frequency of occurrence of values in a vector.

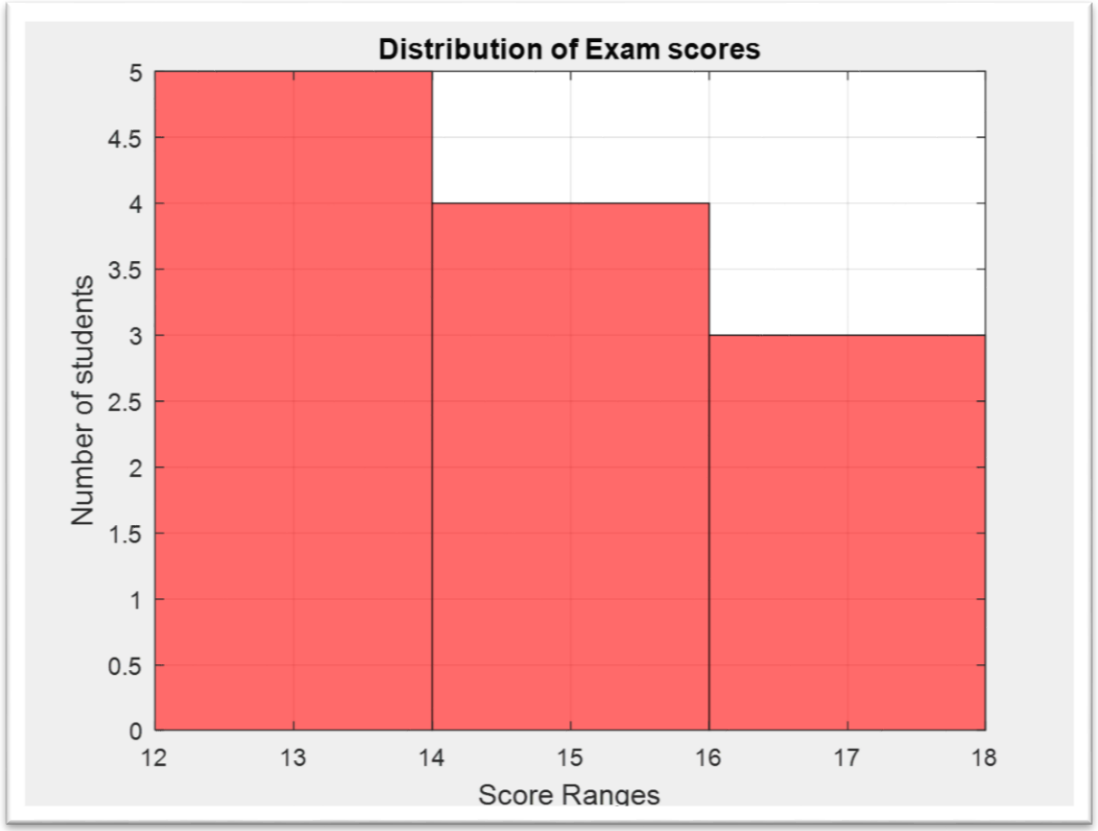
In this histogram we have added the following specifications :

BinWidth: Sets the bin size to 2 (12-14, 14-16, 16-18)

FaceColor: Sets the color of the bars red.

grid: Adds grid lines to make the plot easier to read

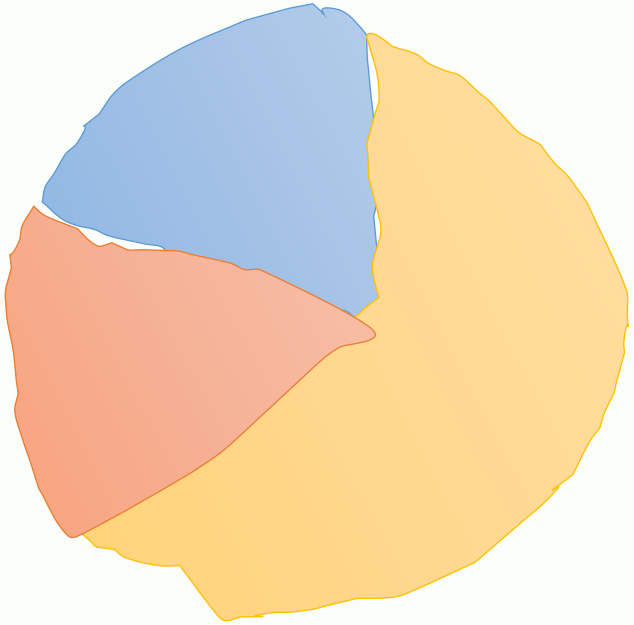

```
data = [15, 12, 13, 13, 16, 17, 15, 12, 14, 12, 15, 16];

figure

histogram(data, 'BinWidth',2, 'FaceColor', 'red');

title('Distribution of Exam scores');

xlabel('Score Ranges');

ylabel('Number of students');

grid on;
```



1. Other specialized 2D plots

`pie()`

The **`pie()`** function creates a pie chart and **draws the percentage of each element in a vector** starting from the top of the circle and going around counterclockwise.



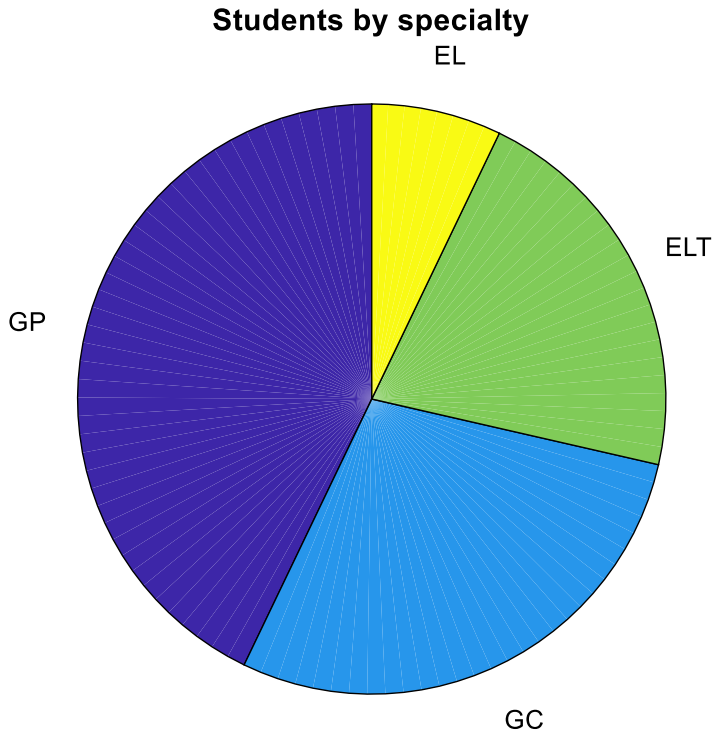
1. Other specialized 2

`pie()`

The **`pie()`** function creates a pie chart and **draws the percentage of each element in a vector** starting from the top of the circle and going around counterclockwise.

The next example introduces the use of the **`pie()`** function to highlight the distribution of students in four specializations.

```
nbstudents = [30, 20, 15, 5];

Spec = {'GP', 'GC', 'ELT', 'EL'};

figure

pie(nbstudents, Spec);

title('Students by specialty');
```



2. 3D plots

MATLAB provides many functions to display 3D plots.

In general, the 3D functions have the same name of the 2D functions with the addition of 3 in the end of the 2D function:

plot3()

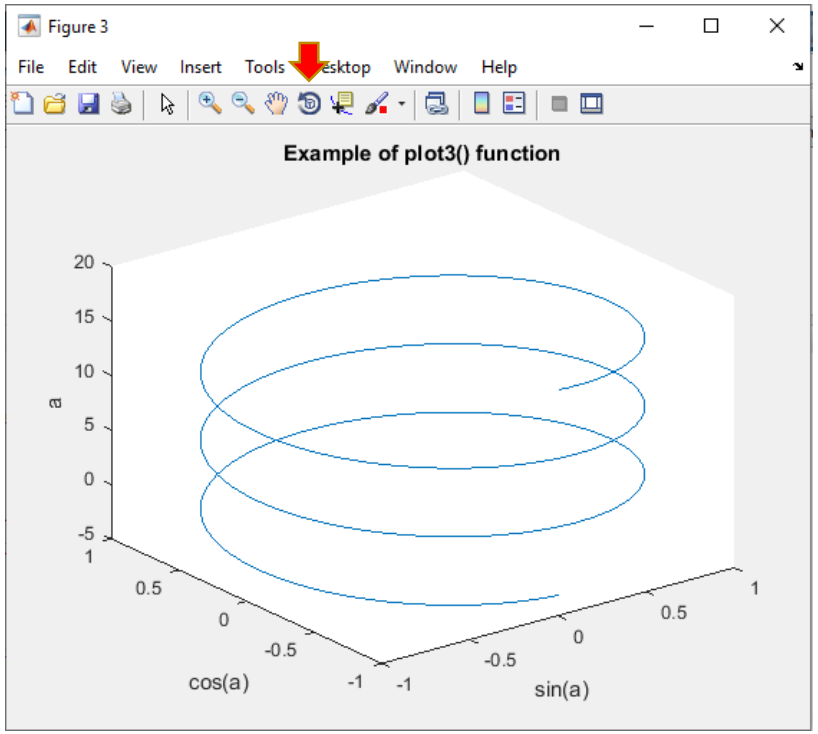
bar3(), barh3()

pie3()

...

By clicking on the 3D icon, the user can **rotate easily the plot** to see it from different angles.


```
a = -pi:pi/50:5*pi;

figure

plot3(sin(a), cos(a),a);

xlabel('sin(a)');

ylabel('cos(a)');

zlabel('a');

title('Example of plot3() function');
```



Practice