Algoritmusok Tervezése

3. Előadás

MATLAB 3.

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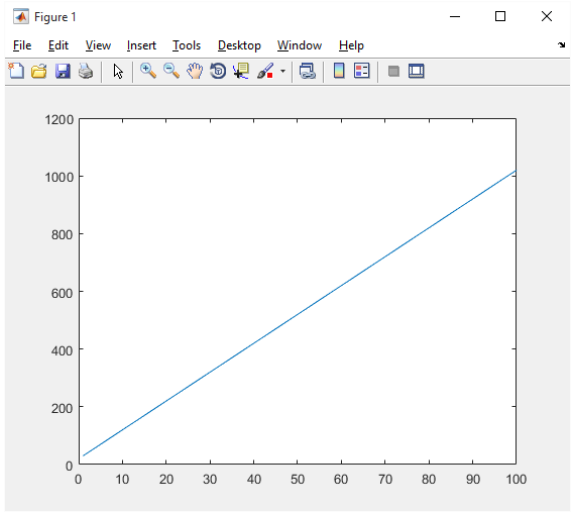
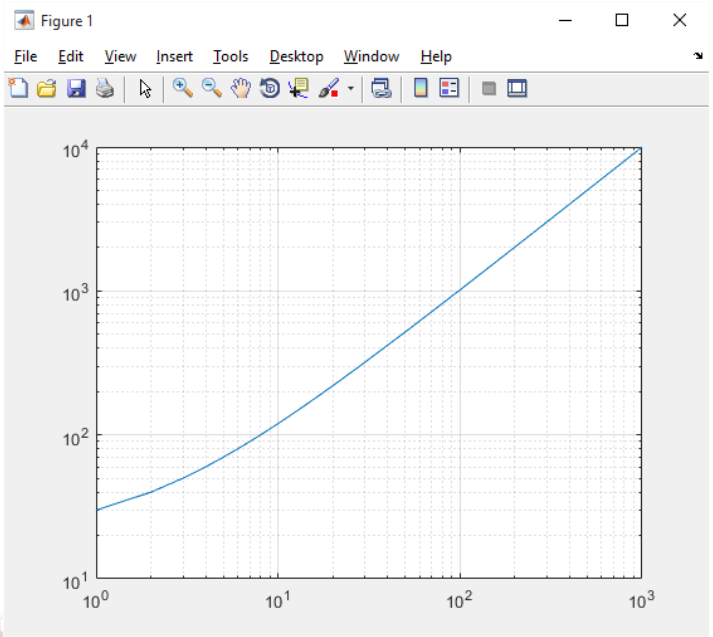
Diagramok készítése

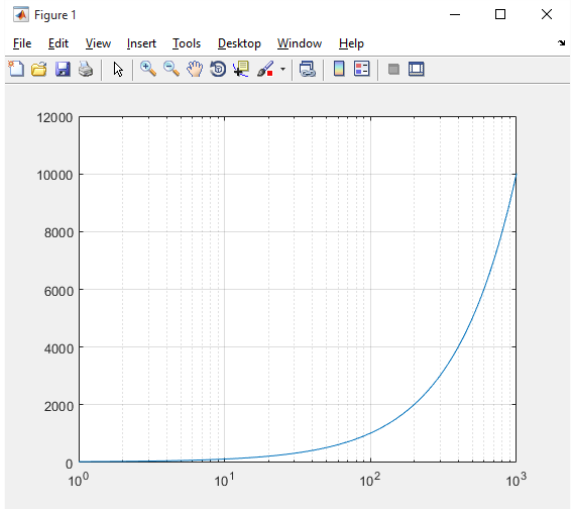
- figure parancs
  - létrehoz egy új képet
  - figure(n) –n szám azonosítóval hoz létre ábrát
- close
  - close (n) az n számmal, vagy a vektorban jelzett számokkal azonosított ábrákat bezárja
  - close all minden ábrát bezár

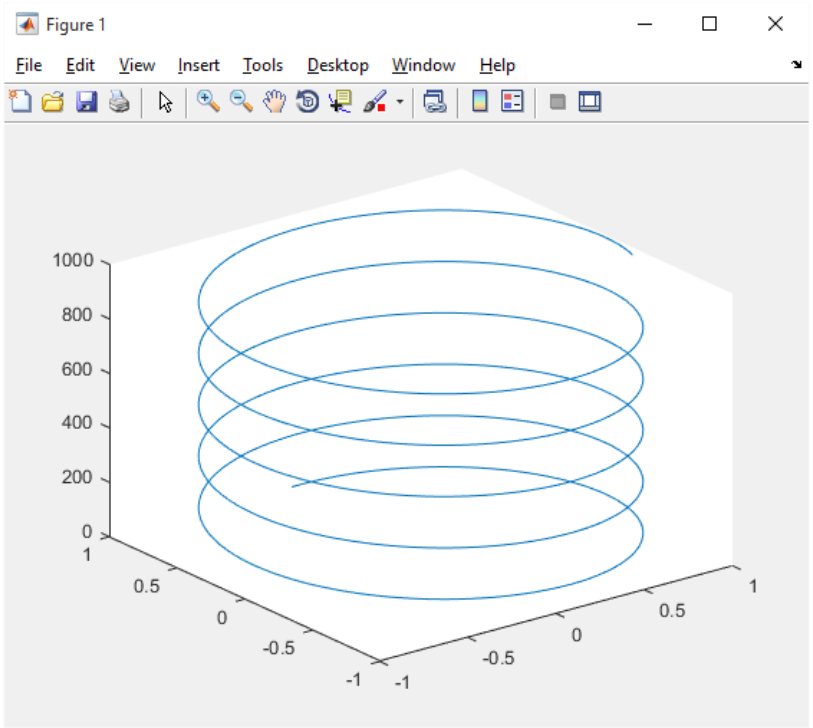
Line Plots

plot	2-D line plot
plot3	3-D line plot
loglog	Log-log scale plot
semilogx	Semilogarithmic plot
semilogy	Semilogarithmic plot



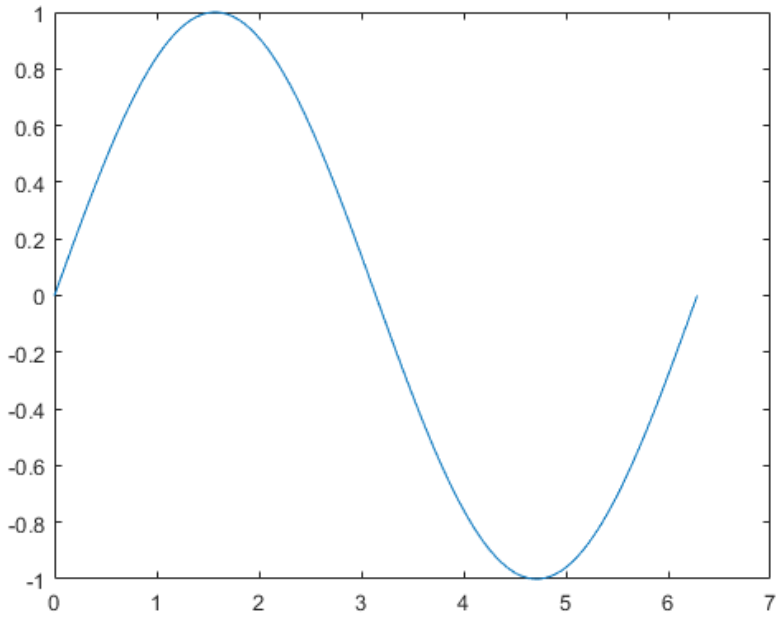




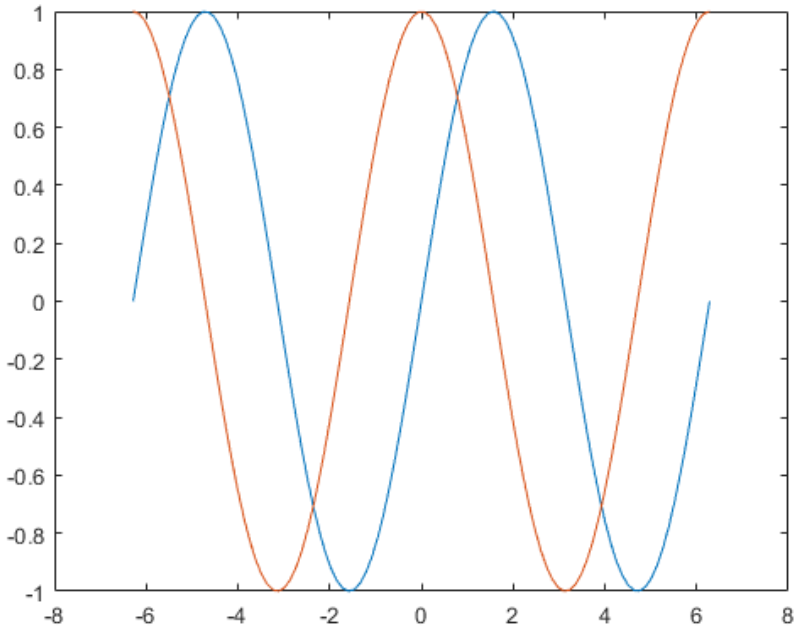


plot


```
x = 0:pi/100:2*pi;
y = sin(x);
Create a line plot of the data.
figure % opens new figure window
plot(x,y)
```



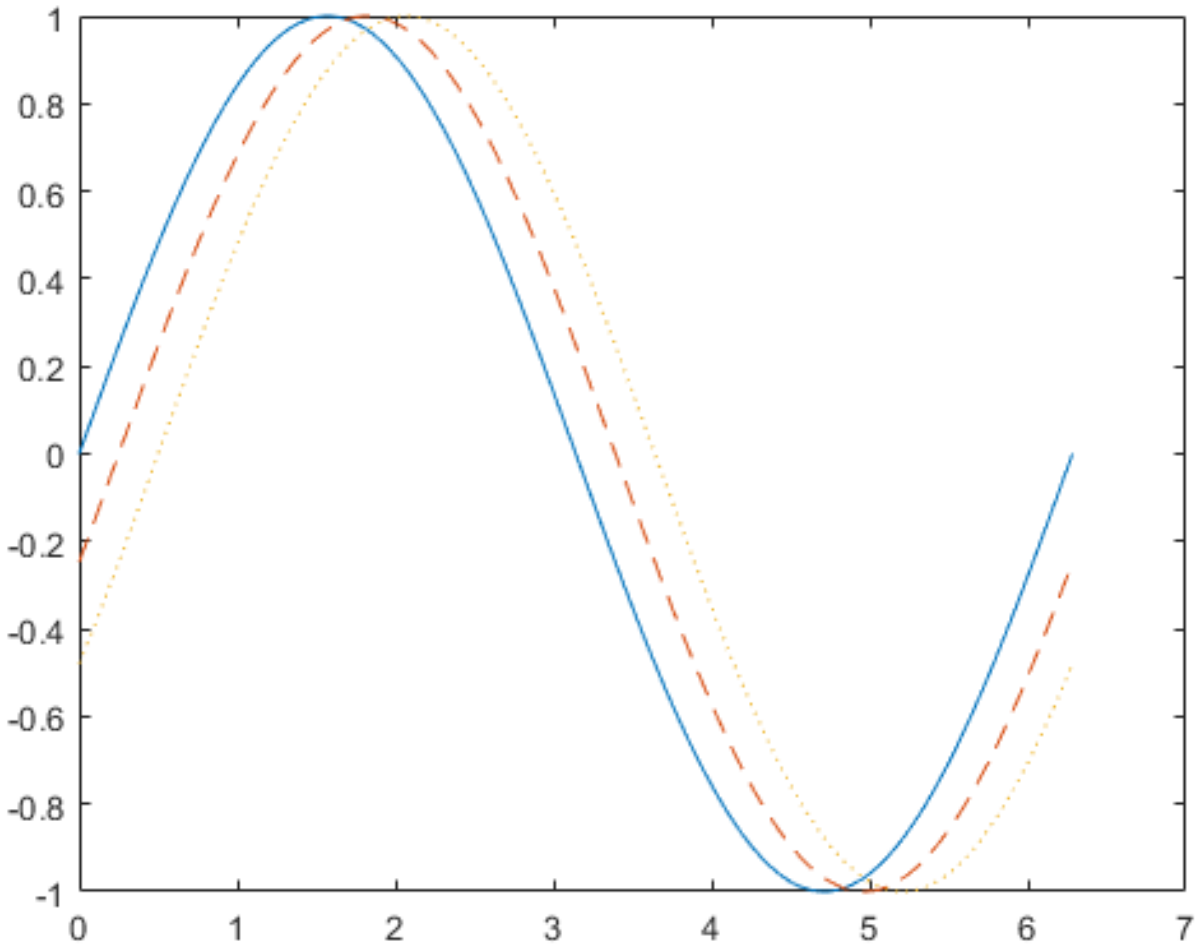

```
x = linspace(-2*pi,2*pi);
y1 = sin(x);
y2 = cos(x);
figure
plot(x,y1,x,y2)
```



Line Style


```
x = 0:pi/100:2*pi;
y1 = sin(x);
y2 = sin(x-0.25);
y3 = sin(x-0.5);

figure
plot(x,y1,x,y2,'--',x,y3,':')
```



Line style 2

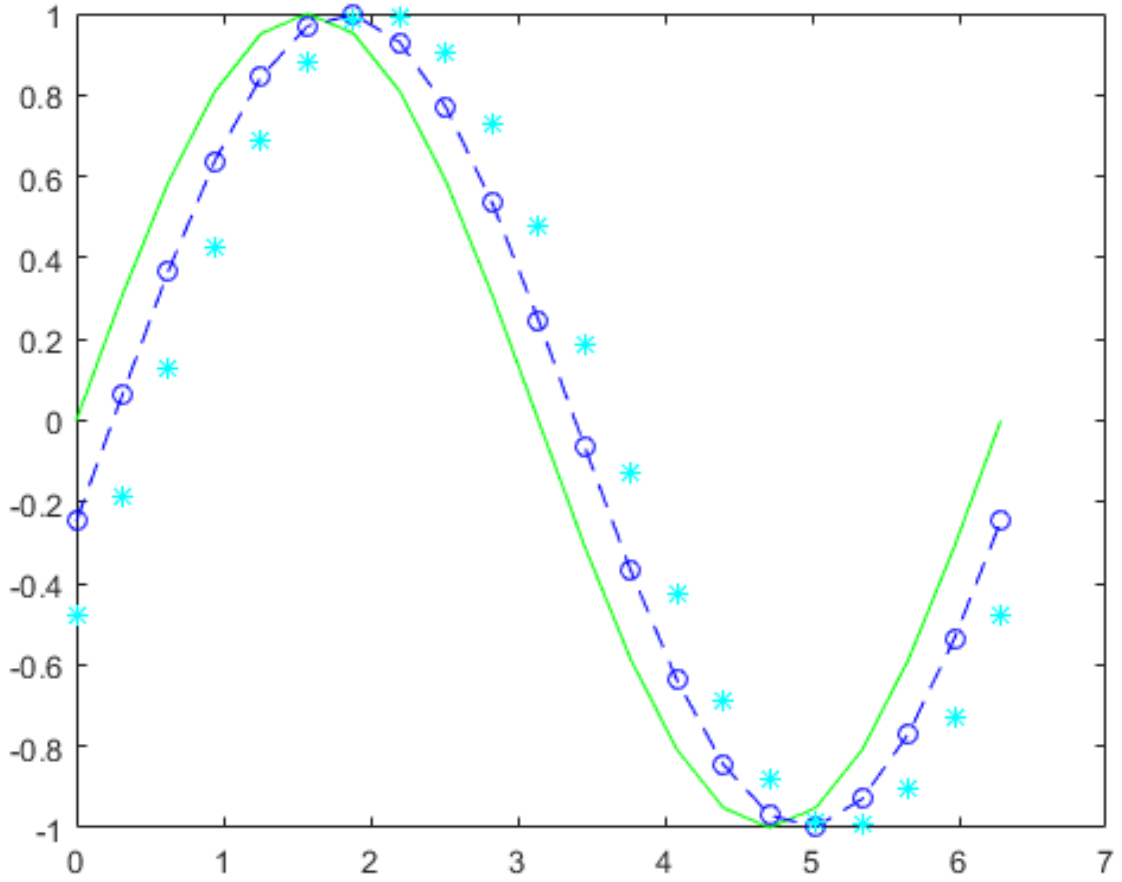
-	Solid line (default)
--	Dashed line
:	Dotted line
-.	Dash-dot line

y	yellow
m	magenta
c	cyan
r	red
g	green
b	blue
w	white
k	black

o	Circle
+	Plus sign
*	Asterisk
.	Point
x	Cross
s	Square
d	Diamond
^	Upward-pointing triangle
v	Downward-pointing triangle
>	Right-pointing triangle
<	Left-pointing triangle
p	Pentagram
h	Hexagram

Line Style 3

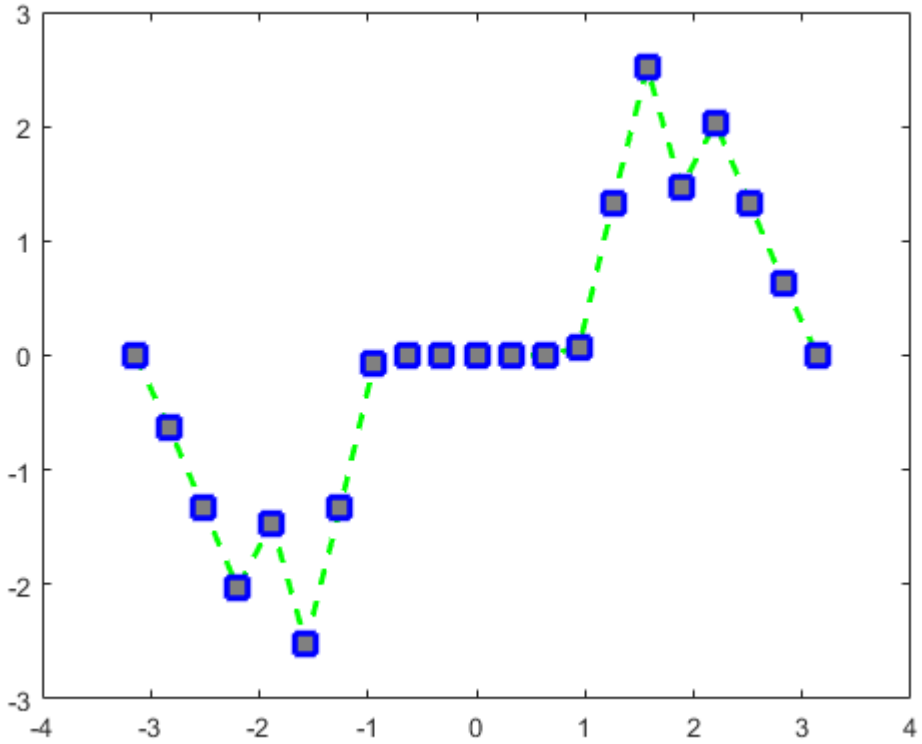

```
x = 0:pi/10:2*pi;
y1 = sin(x);
y2 = sin(x-0.25);
y3 = sin(x-0.5);
figure
plot(x,y1,'g',x,y2,'b--o',x,y3,'c*')
```



Line Properties 1


```
x = -pi:pi/10:pi;
y = tan(sin(x)) - sin(tan(x));

figure
plot(x,y,'--gs',...
    'LineWidth',2,...
    'MarkerSize',10,...
    'MarkerEdgeColor','b',...
    'MarkerFaceColor',[0.5,0.5,0.5])
```



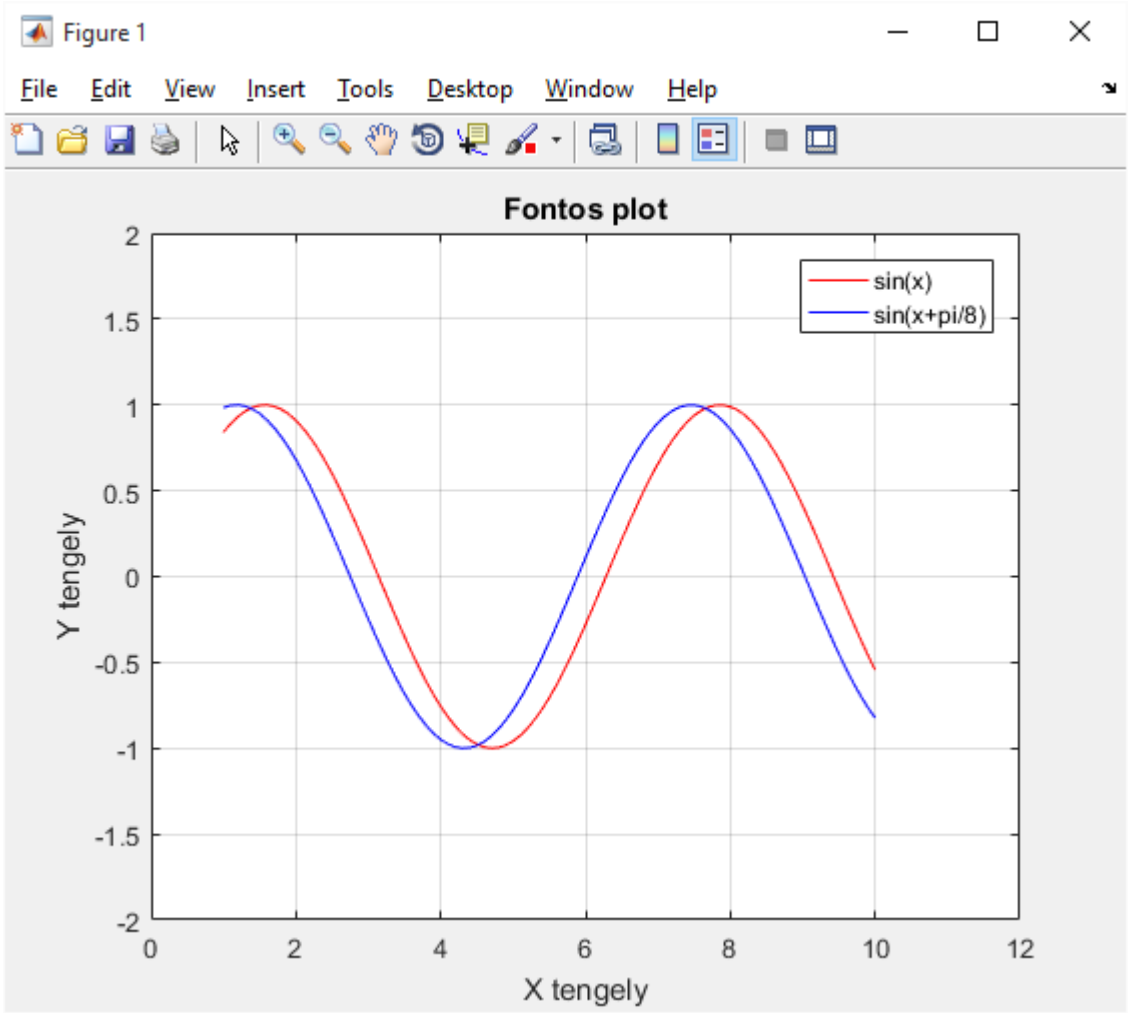
LineWidth — Specifies the width (in points) of the line.
MarkerEdgeColor — Specifies the color of the marker or the edge color for filled markers (circle, square, diamond, pentagram, hexagram, and the four triangles).
MarkerFaceColor — Specifies the color of the face of filled markers.
MarkerSize — Specifies the size of the marker in points (must be greater than 0).

Formatting figures

title	Add title to axes or legend
xlabel	Label x-axis
ylabel	Label y-axis
zlabel	Label z-axis
legend	Add legend to graph
hold	on/off Retain current plot when adding new plots
grid	on/off Display or hide axes grid lines
axis	[xmin xmax ymin ymax] Set the x-axis limits to ran ge from xmin to xmax. Set the y-axis limits to rang e from ymin to ymax.

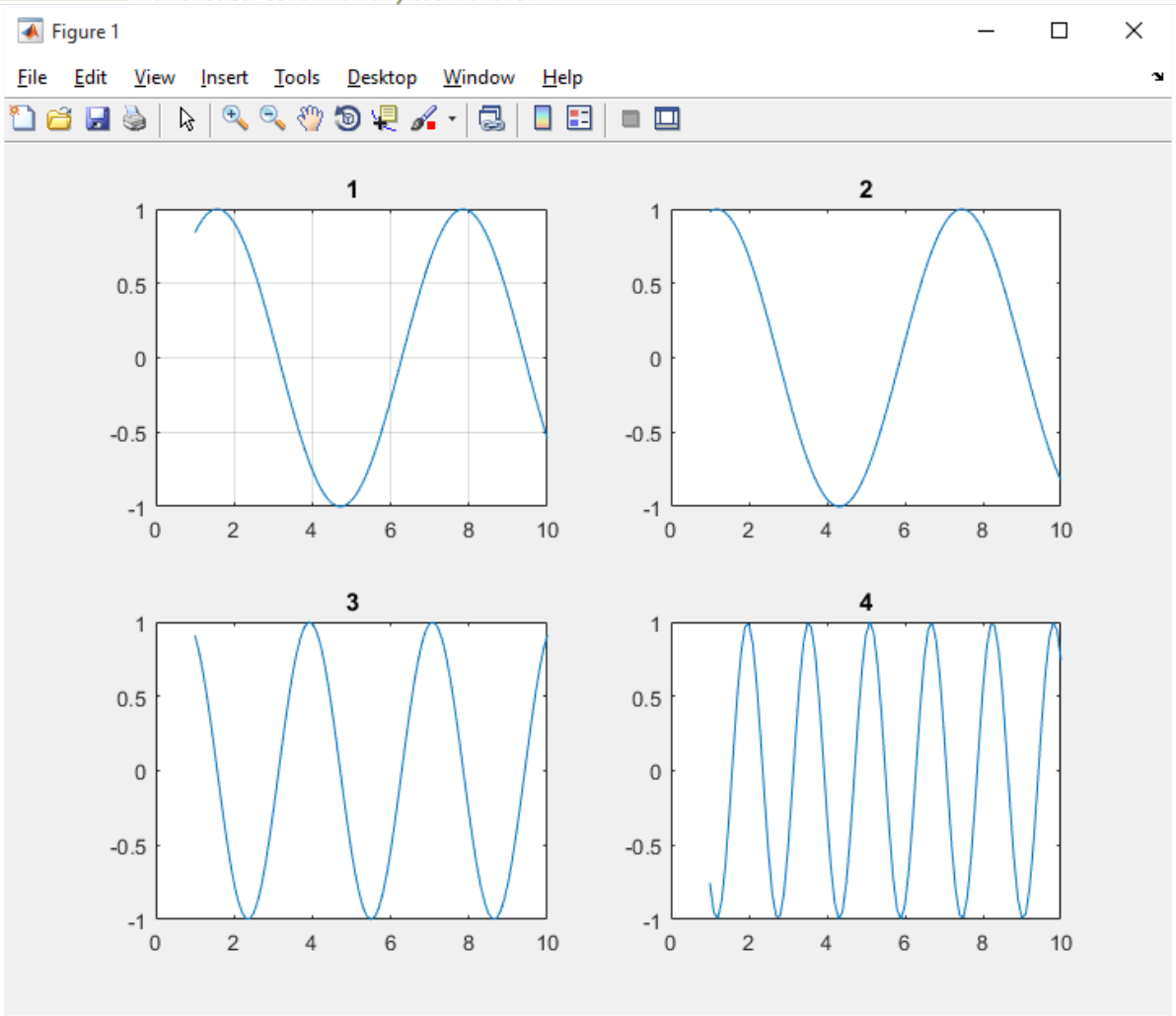
Formatting example


```
x=1:0.1:10;
y1=sin(x);
y2=sin(x+pi/8);
figure(1);
plot(x,y1,'r');
hold on;
plot(x,y2,'b');
title('Fontos plot');
xlabel('X tengely');
ylabel('Y tengely');
grid on;
legend('sin(x)','sin(x+pi/8)');
axis([0,12,-2,2]);
```



subplot

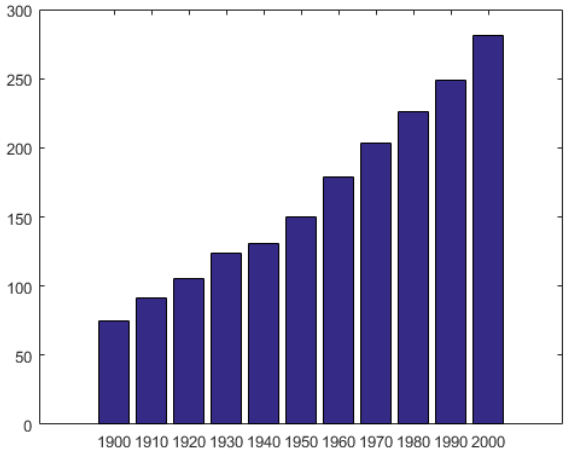

```
figure(1);
x=1:0.1:10;
y1=sin(x);
y2=sin(x+pi/8);
y3=sin(2*x);
y4=sin(4*x);
subplot(2,2,1);
plot(x,y1);
title('1');grid
on;
subplot(2,2,2);
plot(x,y2);
title('2');
……
```



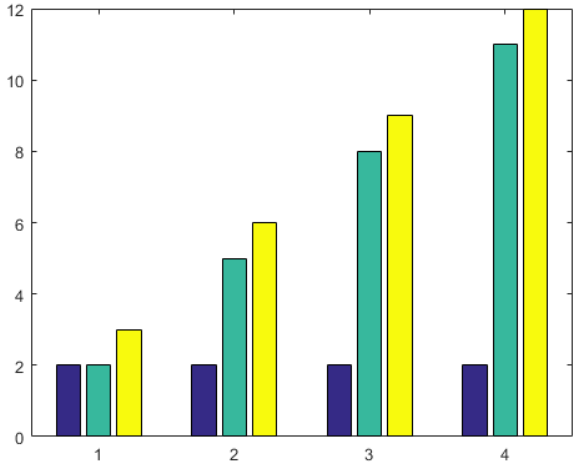
bar plots

- bar(y)
- bar(x,y)

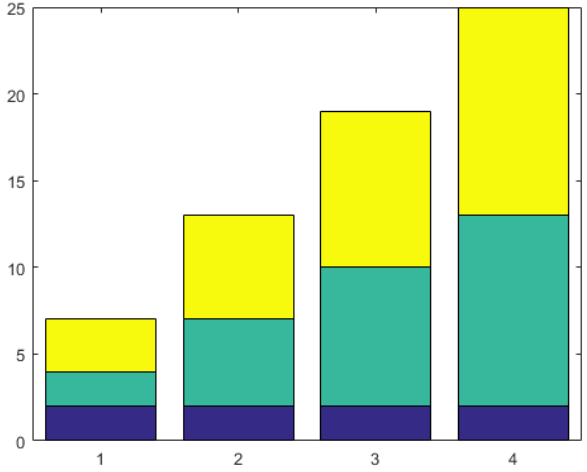
```
x = 1900:10:2000;
y = [75 91 105 123.5 131 150
179 203 226 249 281.5];
bar(x,y)
```




```
y = [2 2 3; 2 5 6; 2 8 9; 2 11 12];
bar(y)
```



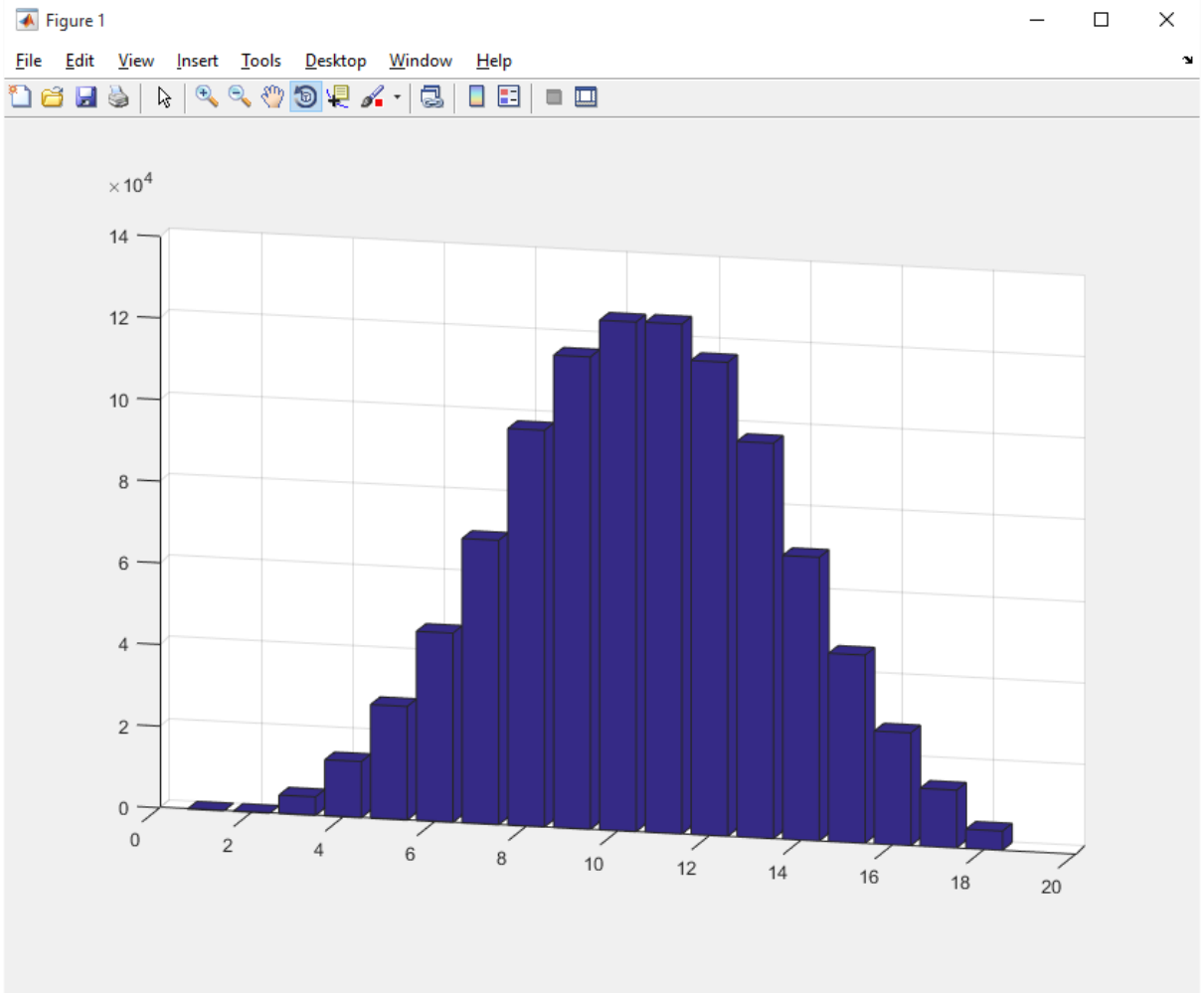

```
y = [2 2 3; 2 5 6; 2 8 9; 2 11 12];
bar(y,'stacked')
```



bar3 plots

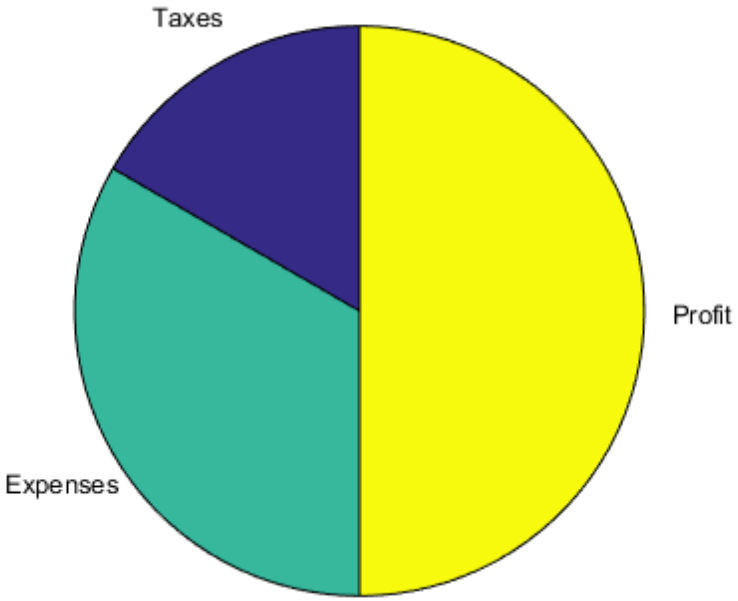
- bar3(y)
- bar3(x,y)

```
%3 dobókocka összege
x=1:18;
y=zeros(1,18);
for i=1:1000000
s=floor(rand*6)+
      floor(rand*6)+floor(rand*6)+3;
y(s)=y(s)+1;
end
figure(1);
bar3(x,y);
```

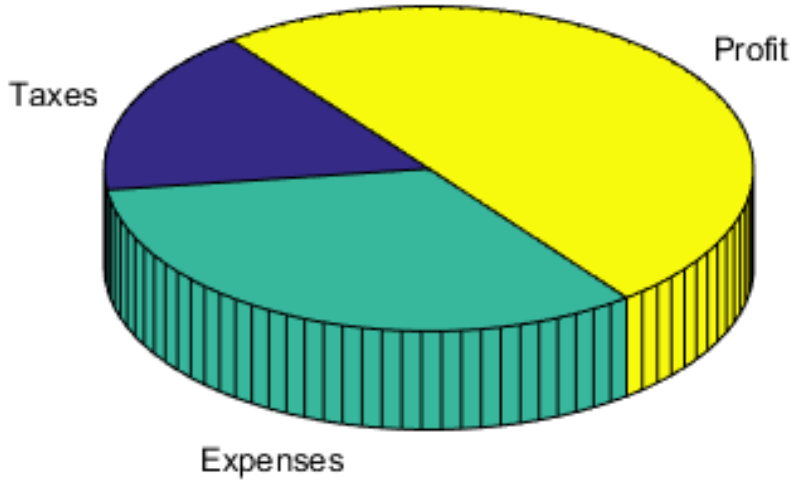


pie


```
X = 1:3;
labels = {'Taxes','Expenses','Profit'};
pie(X,labels)
```




```
x = 1:3;
labels = {'Taxes','Expenses','Profit'};
pie3(x,labels)
```



surf


```
x=-4:0.1:4;
y=-4:0.1:4;
z=sin(x'*y);
surf(x,y,z);
```