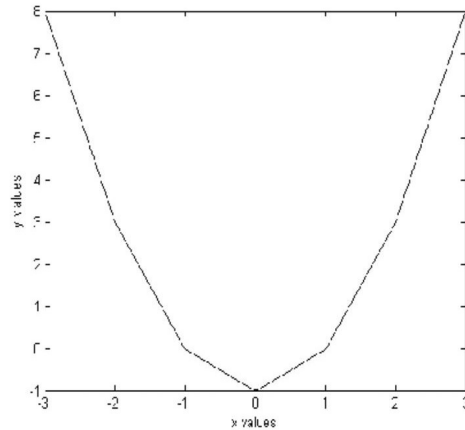


Example

```
x = [-3 -2 -1 0 1 2 3];  
y = (x.^2) -1;  
plot(x, y, 'r');  
xlabel('x values');  
ylabel('y values');
```



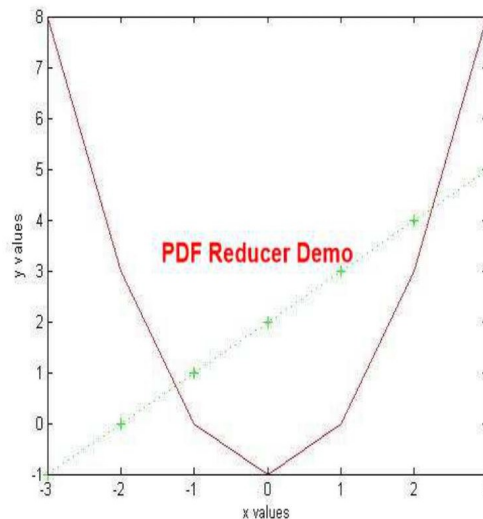
Hold

HOLD Hold current graph.

- HOLD ON holds the current plot and all axis properties so that subsequent graphing commands add to the existing graph.
- HOLD OFF returns to the default mode

Example

```
x = [-3 -2 -1 0 1 2 3];  
y = (x.^2) -1;  
plot(x, y, 'r');  
xlabel('x values');  
ylabel('y values');  
hold on;  
y1 = x + 2;  
plot(x, y1, 'g+');
```



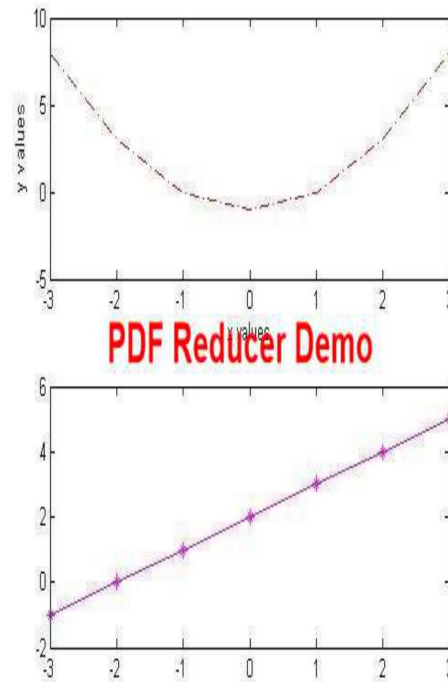
Subplot

SUBPLOT Create axes in tiled positions.

- SUBPLOT(m,n,p), or SUBPLOT(mnp), breaks the Figure window into an m-by-n matrix of small axes

Example

```
x = [-3 -2 -1 0 1 2 3];  
y1 = (x.^2) -1;  
% Plot y1 on the top  
subplot(2,1,1);  
plot(x, y1, 'r-');  
xlabel('x values');  
ylabel('y values');  
% Plot y2 on the bottom  
subplot(2,1,2);  
y2 = x + 2;  
plot(x, y2, 'm*-');
```



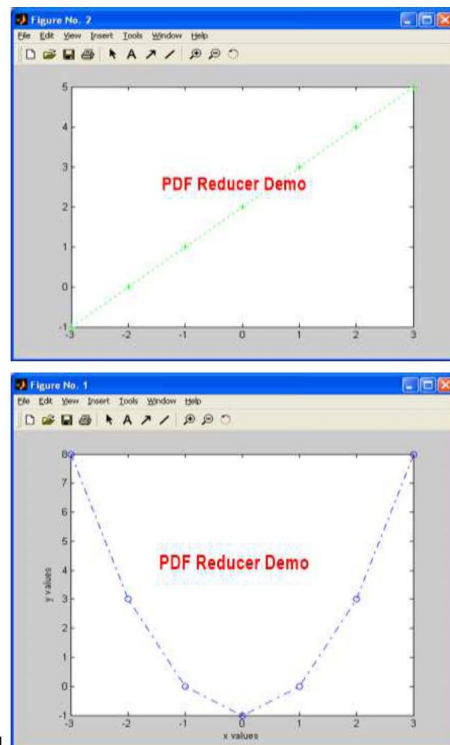
Figure

FIGURE Create figure window.

- **FIGURE**, by itself, creates a new figure window, and returns its handle.

Example

```
x = [-3 -2 -1 0 1 2 3];  
y1 = (x.^2) -1;  
% Plot y1 in the 1st Figure  
plot(x, y1, 'bo-');  
xlabel('x values');  
ylabel('y values');  
% Plot y2 in the 2nd Figure  
figure  
y2 = x + 2;
```



```
plot(x, y2, 'g+');
```

Surface Plot

```
x = 0:0.1:2;
```

```
y = 0:0.1:2;
```

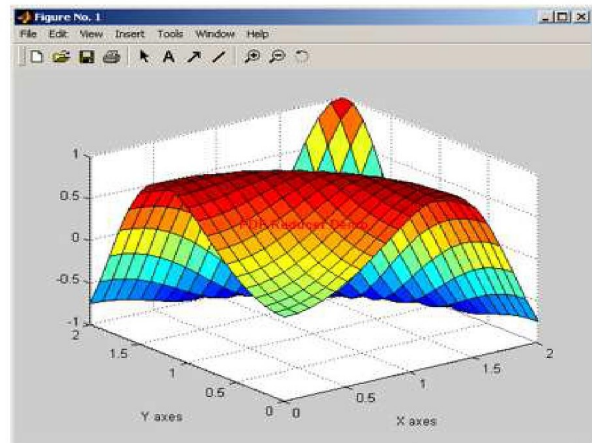
```
[xx, yy] = meshgrid(x,y);
```

```
zz=sin(xx.^2+yy.^2);
```

```
surf(xx,yy,zz)
```

```
xlabel('X axes')
```

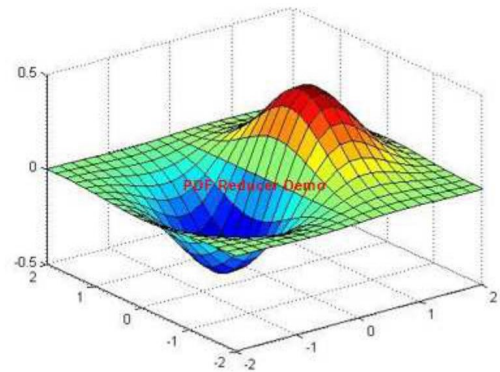
```
ylabel('Y axes')
```



```
[X,Y] = meshgrid(-2:2:2, -2:2:2);
```

```
Z = X .* exp(-X.^2 - Y.^2);
```

```
surf(X,Y,Z)
```



2D line plot

```
x=0:0.05:5;
```

```
y=sin(x.^2);
```

```
plot(x,y);
```

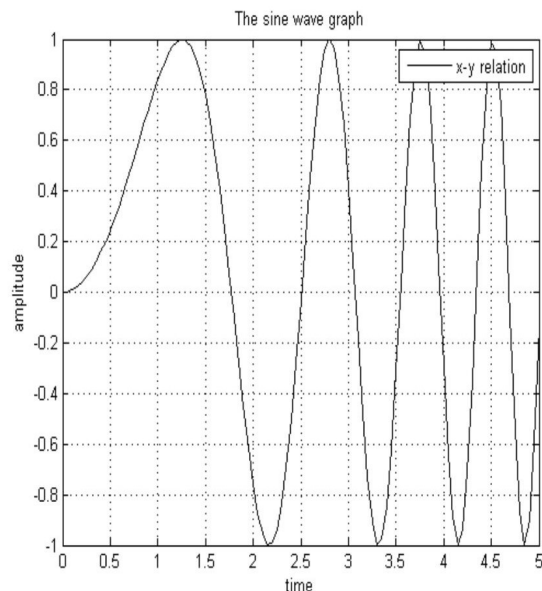
```
xlabel('time');
```

```
ylabel('amplitude');
```

```
grid;
```

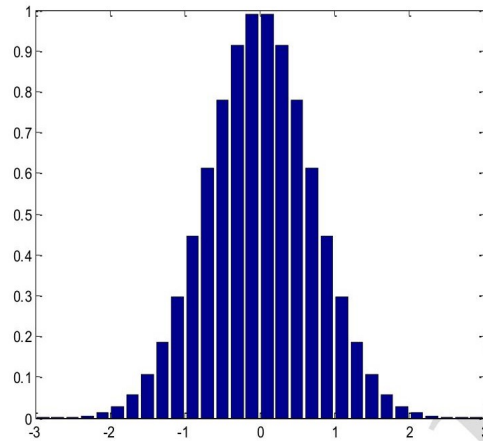
```
title('The sine wave graph')
```

```
legend('x-y relation');
```



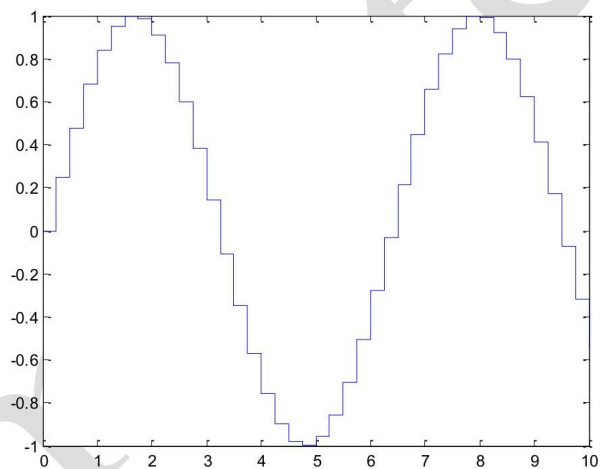
Bar plot

```
x= -2.9:0.2:2.9;  
bar(x,exp(-x.*x));
```



Stairstep plot of sine wave

```
x=0:0.25:10;  
stairs(x,sin(x));
```



2D Graphics

Some of 2D functions in Matlab:

- plot
- area
- polar
- stairs
- pie
- bar

3D Graphics

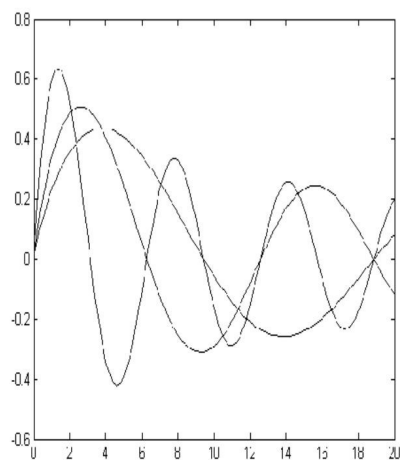
Some of 3D functions in Matlab:

- plot3
- mesh
- pie3
- surf
- sphere

2D

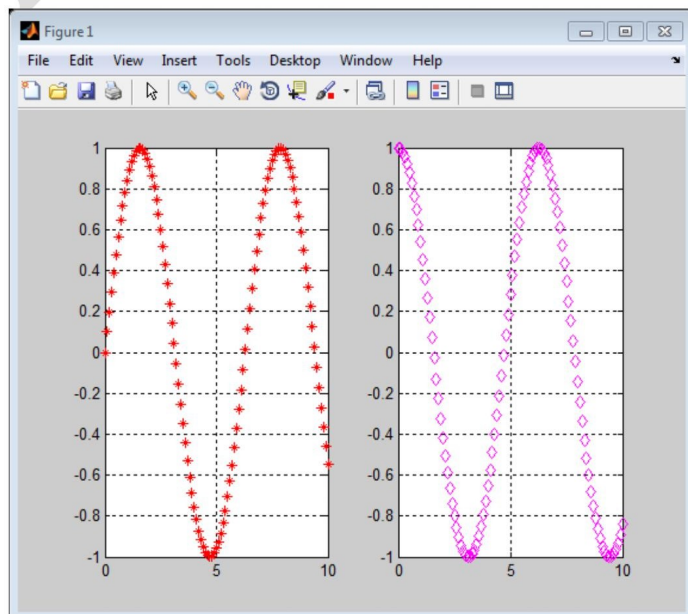
Example 1

```
x = 0:0.2:20;  
y = sin(x)./sqrt(x+1);  
y(2,:) = sin(x/2)./sqrt(x+1);  
y(3,:) = sin(x/3)./sqrt(x+1);  
plot(x,y)
```



Example 2

```
clc  
clear  
close all  
x=0:0.1:10;  
y=sin(x);  
z=cos(x);  
subplot(1,2,1)  
plot(x,y,'r*');  
grid  
subplot(1,2,2)  
plot(x,z,'md');
```



grid

Example 3

clc

clear

close all

x=0:0.1:10;

y=sin(x);

z=cos(x);

v=exp(x);

subplot(3,3,[1 2 3 4 5 6])

plot(x,y,'r*');

grid

subplot(3,3,7)

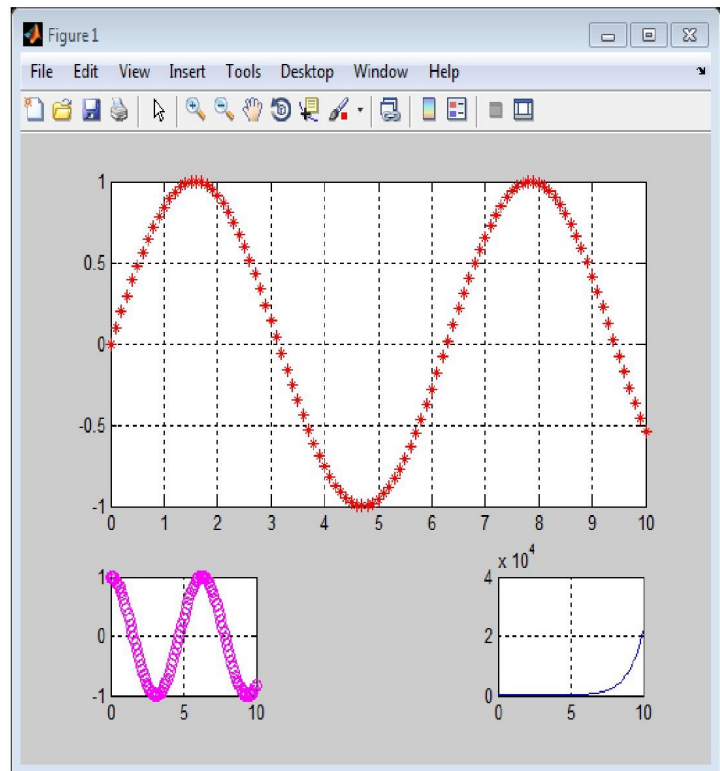
plot(x,z,'mo');

grid

subplot(3,3,9)

plot(x,v);

grid



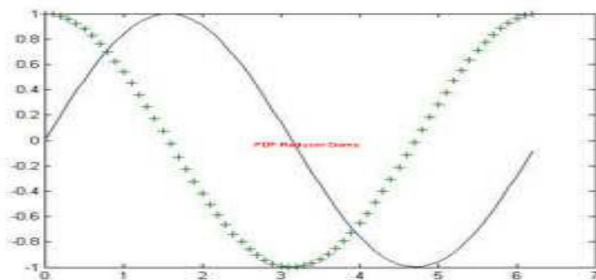
Example 4

x = 0 : 0.1 : 2*pi;

y1 = sin(x);

y2 = cos(x);

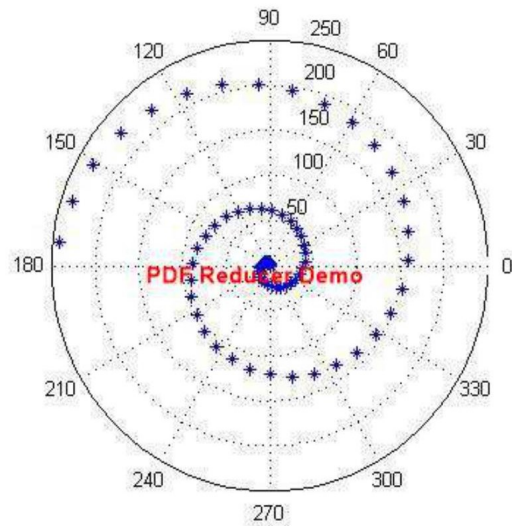
plot(x, y1, '- ', x, y2, '+')



```
theta*5 :0.2 :0 = pi;
```

```
rho = theta.^2;
```

```
polar(theta, rho, '*')
```



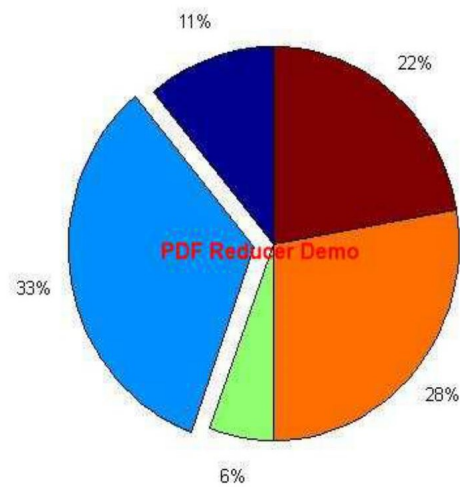
Example 5

```
x = [1 3 0.5 2.5 2];
```

```
explode = [0 1 0 0 0];
```

```
pie(x,explode);
```

```
colormap jet;
```



Example 6

```
Y = [1, 5, 3;
```

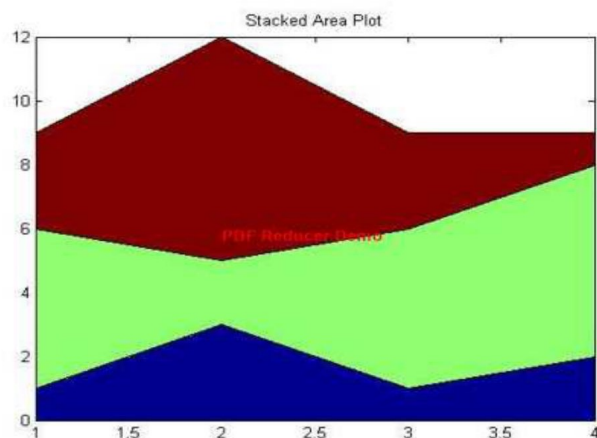
```
3, 2, 7;
```

```
1, 5, 3;
```

```
2, 6, 1];
```

```
area(Y);
```

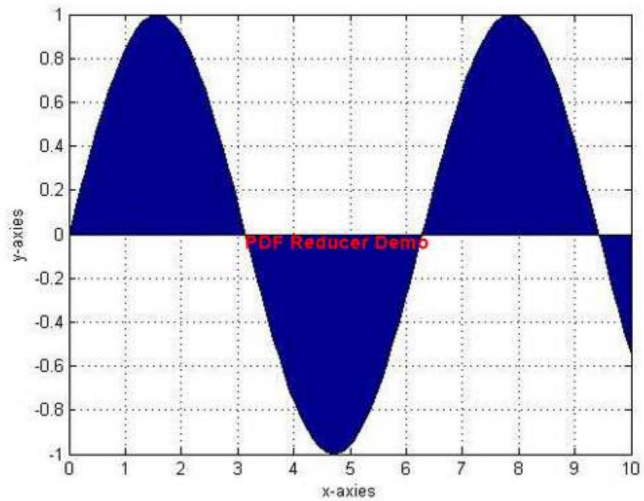
```
title ('Area Plot');
```



```

clc
clear
close all
x=linspace(0,10,100);
y=sin(x);
area(x,y);
grid
xlabel('x-axes');
ylabel('y-axes');

```



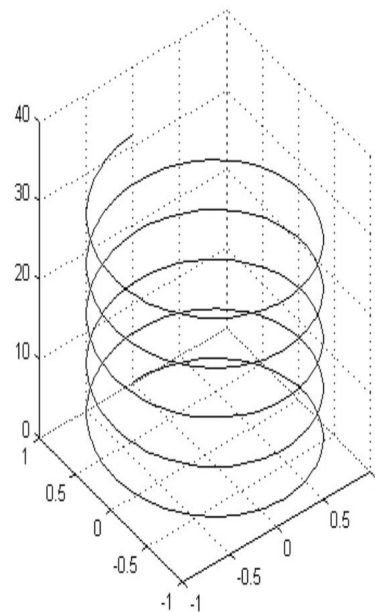
3D

Example 1

```

clc
clear
close all
t = 0:pi/50:10*pi;
plot3(sin(t),cos(t),t)
axis square;
grid

```

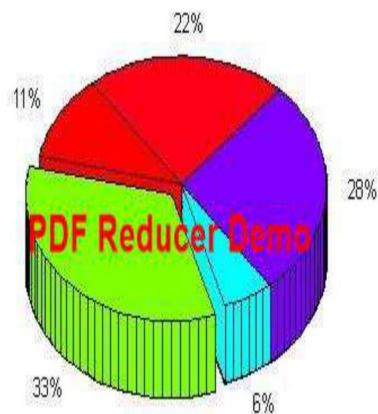


Example 2

```

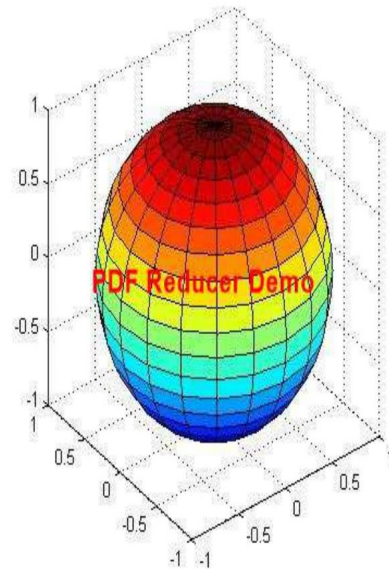
x = [1 3 0.5 2.5 2];
explode = [0 1 0 0 0];
pie3(x,explode)
colormap hsv

```



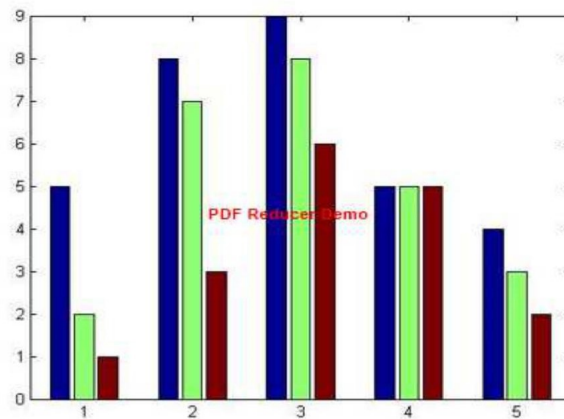
Example 3

figure
sphere
axis equal

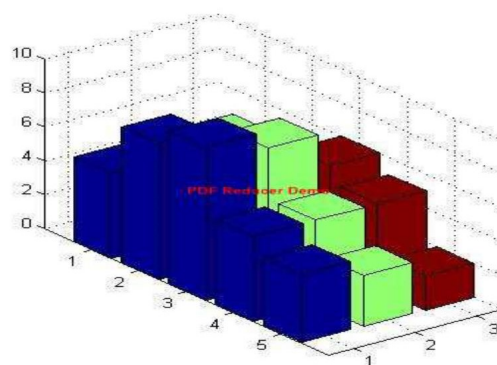


Example 4

$Y = \begin{bmatrix} 5 & 2 & 1 \\ 8 & 7 & 3 \\ 9 & 8 & 6 \\ 5 & 5 & 5 \\ 4 & 3 & 2 \end{bmatrix};$
 $\text{bar}(Y)$

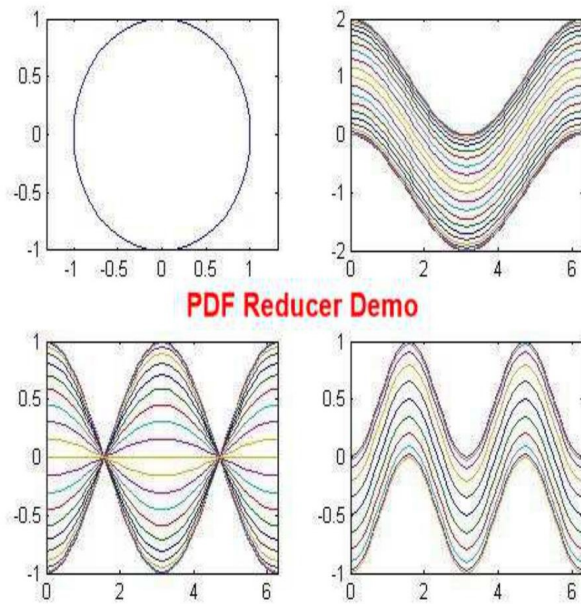


$Y = \begin{bmatrix} 5 & 2 & 1 \\ 8 & 7 & 3 \\ 9 & 8 & 6 \\ 5 & 5 & 5 \\ 4 & 3 & 2 \end{bmatrix};$
 $\text{bar3}(Y)$



Subplot Example

```
t = 0:pi/20:2*pi;  
[x,y] = meshgrid(t);  
subplot(2,2,1)  
plot(sin(t),cos(t))  
axis equal  
subplot(2,2,2)  
z = sin(x)+cos(y);  
plot(t,z)  
axis([0 2*pi -2 2])  
subplot(2,2,3)  
z = sin(x).*cos(y);  
plot(t,z)  
axis([0 2*pi -1 1])  
subplot(2,2,4)  
z = (sin(x).^2)-(cos(y).^2);  
plot(t,z)  
axis([0 2*pi -1 1])
```



Exercise

Q1) Write Matlab script for draw the area of the following function: $f = \ln(x)$, $0 \leq x \leq 20$ then 40 point. And properties of first function is (red, plus, dashed), and Properties of second function (cay, star, dotted), Added three options in the graph.

Q2) Write Matlab script for draw two functions: $y = \sqrt{x} + 1, z = x^2 + 2$, $0 \leq x \leq 5\pi$. And properties of first function is (yellow, plus, dashed), and Properties of second function (cay, star, dotted), Added three options in the graph. Used the subplot command to display these functions on two windows on the same graph

Q3) Write Matlab script for draw two functions: $y = f = e^{-4t}, z = x^2$, $0 \leq x \leq 5\pi$. And properties of first function is (yellow, plus, dashed), and Properties of second function (cay, star, dotted), Added three options in the graph. Each graph must display on window.

Q4) calculate the percentage value the grade of student in mathematic department, then Write a script and draw a pie graph of the percentage, the graph should explode excellent sections at the following table.

A

pass	mid	good	Very good	excellent
56	30	20	12	5

a) Write Matlab script for draw the two following functions: $M = \sin(x), N = \cos^2(x)$,

$0 \leq x \leq 2\pi$. Using 100 data point, each function must display on window. And properties of first function is (Black, diamond, dashed), and Properties of second function (blue, square, dotted), Added three options in the graph.

b) Evaluate with using the Matlab script, the solution of the following equations:

$$A+B-C+D=15$$

$$3A-6B+5C-D=6$$

$$-2A-5B+6C+D=8$$

$$A-9B-7C-5D=0$$

Q1) For the matrix $A = [1,2,3;4,5,6;7,8,9;10,11,12]$,using Matlab script

1- Draw the bar graph of the matrix A.

- 2- Find the matrix B which is a reshape of the matrix A, but with 6 rows and 2 columns.
- 3- Draw the stairs graph of the matrix B.
- 4- Two graph display on the same window.
- 5- **Q3) a)** Write Matlab script for draw the two following functions: $f = e^{-4t}$, $g = \cos(5t)$, $0 \leq x \leq 5$.
- 6- Used the subplot command to display these functions on two windows on the same
- 7- graph, and properties of first function is (red, plus, dashed), and Properties of second function (cyan, star, dotted), Added three options in the graph.

Chapter five

Programming in MATLAB

Input and fprintf

```
fx>> x=input('please enter a number :')
```

```
please enter a number : 100
```

```
x =
```

```
100
```

```
fx >> fprintf('%d',x)
```

```
100>>
```

```
fx >>
```

fprintf('format', x,...)

Format Code Description

- %d integer format
- %f Decimal format

Control code Description

- \n Start new line
- \t Tab

Text string,error message

- Text string are entered into matlab surrounded by single quotes

```
fx>> s='this is a text'
```

- Text string can be displayed with

```
fx>> disp('this is message')
```

- Error message are best display with

```
fx>> error('sorry, this is error')
```

Relational operators in MATLAB

Example	Operator	Relationship
x == 5	==	Equal to
y ~= 4	~=	Not equal to
b < 0	<	Less than
u > v	>	Greater than
5 <= 7	<=	Less than or equal to
4 >= 3	>=	Greater than or equal to

Control Structures

- If Statement Syntax

if (Condition_1)

Matlab Commands

elseif (Condition_2)

Matlab Commands

elseif (Condition_3)

Matlab Commands

else

Matlab Commands

end

Examples

if ((a>3) & (b==5))

Some Matlab Commands;

end

if (a<3)

Some Matlab Commands;

elseif (b~=5)

Some Matlab Commands;

End

if (a<3)

Some Matlab Commands;

else

Some Matlab Commands;

end

Example 1

test.m script file

```
x=input('please enter a number :')
y=input('please enter a number :')
if x>y
fprintf('The number x is greater.\n' )
else
fprintf('The number y is greater.\n' )
end
```

Example 2

```
n = input('Enter an integer: ');
if (rem(n,2)==0)
fprintf('The integer %d is even.\n', n)
else
fprintf('The integer %d is odd.\n', n)
end
```

Example 3

```
a=input('Enter a number a: ');
b=input('Enter a number b: ');
fprintf('\n')
fprintf('1) Add a and b.\n')
fprintf('2) Subtract b from a.\n')
fprintf('3) Multiply a and b.\n')
fprintf('4) Divide a by b.\n')
fprintf('\n')
n=input('Enter your choice: ');
```

```

if n==1
fprintf('The sum of %0.2f and %0.2f is %0.2f.\n',a,b,a+b)
elseif n==2
fprintf('The difference of %0.2f and %0.2f is %0.2f.\n',a,b,a-b)
elseif n==3
fprintf('The product of %0.2f and %0.2f is %0.2f.\n',a,b,a*b)
elseif n==4
fprintf('The quotient of %0.2f and %0.2f is %0.2f.\n',a,b,a/b)
else
fprintf('Not a valid choice.\n')
end

```

Control Structures

- for loop syntax

```

for i=Index_Array
    Matlab Commands
end
%.....
for i=start:inc_value:stop
    Matlab Commands
End

```

Examples

```

for i=1:100
    Some Matlab Commands;
end

```

```

for j=1:3:200
    Some Matlab Commands;
end

```

```

for m=13:-0.2:-21
    Some Matlab Commands;
end

```

```

for k=[0.1 0.3 -13 12 7 -9.3]
    Some Matlab Commands;
end

```

Example 4

```
>> for p=1:10
fprintf('%d\t',p)
end
1 2 3 4 5 6 7 8 9 10 >>
```

```
>> for p=1:2:10
fprintf('%d \t',p)
end
1      3      5      7      9      >>
```

Example 5

```
for k=5:2:13
fprintf('The square of %d is %d.\n', k, k^2)
end
```

```
The square of 5 is 25
The square of 7 is 49
The square of 9 is 81
The square of 11 is 121
The square of 13 is 169
```

Control Structures

- while Loop Syntax
- ```
while (condition)
 Matlab Commands
End
```

#### Example

```
while ((a>3) & (b==5))
 Some Matlab Commands;
end
```

### Example 6

```
k=5;
while k<=13
fprintf('The square of %d is %d.\n', k, k^2)
k=k+2;
end
```

### switch

- switch – Switch among several cases based on expression
- The general form of SWITCH statement is:

```
switch switch_expr
 case case_expr,
 statement, ..., statement
 case {case_expr1, case_expr2, case_expr3, ...}
 statement, ..., statement
 ...
 otherwise
 statement, ..., statement
end
```

### Example 7

```
a=input('Enter a number a: ');
b=input('Enter a number b: ');
fprintf('\n')
fprintf('1) Add a and b.\n')
fprintf('2) Subtract b from a.\n')
fprintf('3) Multiply a and b.\n')
fprintf('4) Divide a by b.\n')
fprintf('\n')
n=input('Enter your choice: ');
fprintf('\n')
switch n
case 1
fprintf('The sum of %.2f and %.2f is %.2f.\n',a,b,a+b)
case 2
fprintf('The difference of %.2f and %.2f is %.2f.\n',a,b,a-b)
case 3
fprintf('The product of %.2f and %.2f is %.2f.\n',a,b,a*b)
case 4
fprintf('The quotient of %.2f and %.2f is %.2f.\n',a,b,a/b)
otherwise
fprintf('Not a valid choice.\n')
end
```

## Programming in MATLAB

### for Loop Example

Using the for loop to compute the Factorial

$$0! = 1$$

$$1! = 1$$

$$2! = 1 \times 2 = 2$$

$$3! = 1 \times 2 \times 3 = 6$$

$$4! = 1 \times 2 \times 3 \times 4 = 24$$

$$5! = 1 \times 2 \times 3 \times 4 \times 5 = 120$$

### factorial.m script file

```
n =input('enter an integer number:')
```

```
x=1;
```

```
for i= 1:n;
```

```
 x =x*i;
```

```
end
```

```
fprintf('the factorial of % d is %d \n',n,x)
```

### Assignment 1

**Write the factorial program using while loop**

### **if statement Example**

The following example compute the grade of a student and print the result for each degree

#### **grade.m script file**

```
degree=input('Enter your degree: ');
fprintf('\n')
if (degree <= 100 & degree >= 90)
fprintf('The grade of the student %0.2f is excellent.\n',degree)
elseif (degree <= 90 & degree >= 80)
fprintf('The grade of the student %0.2f is very good.\n',degree)
elseif (degree <= 80 & degree >= 70)
fprintf('The grade of the student %0.2f is good.\n',degree)
elseif (degree <= 70 & degree >= 60)
fprintf('The grade of the student %0.2f is mid.\n',degree)
elseif (degree <= 60 & degree >= 50)
fprintf('The grade of the student %0.2f is pass.\n',degree)
else
fprintf('Not pass .\n')
end
```

### **Assignment 2**

**Write the grade program using switch statement**

## Programming in MATLAB

Write a program to calculate the average value of a student degrees of five subjects, then print this average value , using

1- for loop

2- while loop

1) for loop

```
sum=0
for i = 1:5
degree=input('enter your degree=')
sum=sum+degree;
end
average = sum/5;
fprintf('The average of the student is: %0.2f\n',average)
```

2) while loop

```
sum=0;
i=1;
while i<=5;
degree=input('enter your degree=')
sum=sum+degree;
i=i+1;
end
average = sum/5;
fprintf('The average of the student is: %0.2f\n',average)
```

**Write a program to test a number, when it is 1, print the number is positive, when the number is 0, print the number is zero, when the number is -1, print the number is negative. For all other numbers, print unknown using:**

**1- if statement**

**2- switch statement**

**1- if statement**

```
number=input('enter a number:');
if number==1
fprintf('the number is positive \n');
elseif number==0
fprintf('the number is zero \n');
elseif number==-1
fprintf('the number is negative \n');
else
fprintf('unknown \n');
end
```

**2- switch statement**

```
number=input('enter a number:');
switch number
case 1
fprintf('the number is positive \n');
case 0
fprintf('the number is zero \n');
case -1
fprintf('the number is negative \n');
otherwise
```

```
fprintf('unknown \n');
end
```

**MATLAB allows to use one loop inside another loop.**

the syntax for a nested for loop statement in MATLAB is as follows

```
for m = 1:j
 for n = 1:k
 <statements>;
 end
end
```

**Write a program to calculate the production table using nested for loop**

```
clc
a=0;
disp('-----')
for i=1:10;
 b=0;
 for j=1:10;
 c(j) =a*b;
 b=b+1;
 end
 disp(c)
 disp('-----')
 a=a+1;
end
```

**String statements**

s =input(statement' 's') returns the entered text as a MATLAB string.

### Example

```
day = input('enter a day: ', 's');
```

```
switch day
```

```
 case 'friday'
```

```
 msgbox('the day is off')
```

```
 case 'saturday'
```

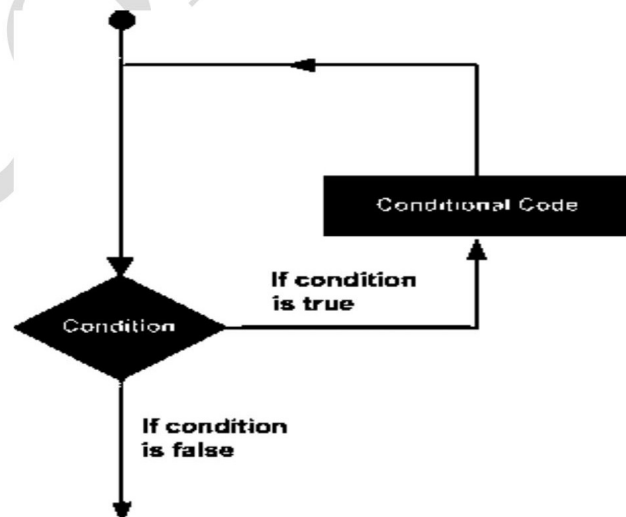
```
 msgbox(' the day is also off')
```

```
 otherwise
```

```
 msgbox(' you must go to college today')
```

```
end
```

### Loop Flow Diagram



### 1) while loop example

```
a = 10;
% while loop execution
while(a <=20)
fprintf('value of a: %d \n', a);
a = a + 1;
end
```

### **1. output**

```
value of a: 10
value of a: 11
value of a: 12
value of a: 13
value of a: 14
value of a: 15
value of a: 16
value of a: 17
value of a: 18
value of a: 19
value of a: 20
```

### **2) for loop**

```
for a = 10:20
fprintf('value of a: %d\n', a);
end
```

### **2. output**

```
value of a: 10
value of a: 11
value of a: 12
value of a: 13
value of a: 14
```

value of a: 15

value of a: 16

value of a: 17

value of a: 18

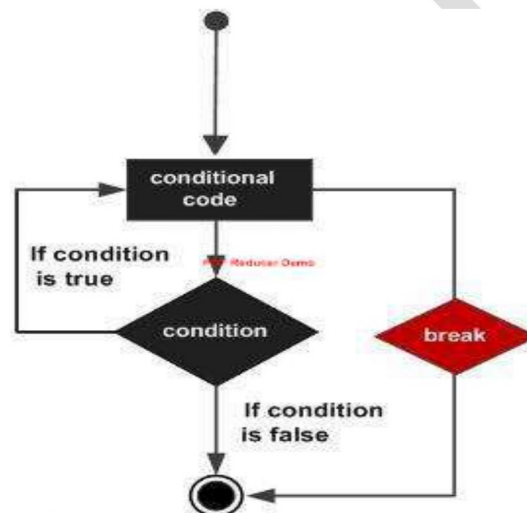
value of a: 19

value of a: 20

### Break statement

The break statement terminates execution of **for** or **while** loop. Statements in the loop that appear after the break statement are not executed.

In nested loops, break exits only from the loop in which it occurs. Control passes to the statement following the end of that loop.



#### 1) Break example

```
a = 10;
```

```
% while loop execution
```

```
while (a <=20)
```

```
fprintf('value of a: %d\n', a);
```

```
a = a+1;
```

```
if(a > 15)
```

```
% terminate the loop using break statement
```

```
break;
```

```
end
```

```
end
```

## 1. output

value of a: 10

value of a: 11

value of a: 12

value of a: 13

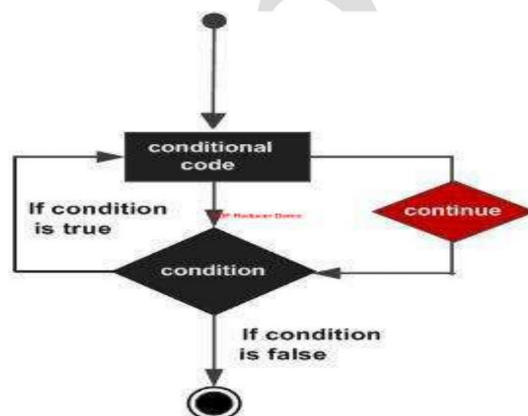
value of a: 14

value of a: 15

## Continue statement

The continue statement is used for passing control to next iteration of for or while loop.

The continue statement in MATLAB works somewhat like the break statement. Instead of forcing termination, however, 'continue' forces the next iteration of the loop to take place, skipping any code in between



### 1) continue exam

```
a = 10;
%while loop execution
while a <= 20
 if a == 15
 % skip the iteration
 a = a + 1;
 continue;
 end
 fprintf('value of a: %d\n', a);
```

```
a = a + 1;
```

```
end
```

### **1. output**

value of a: 10

value of a: 11

value of a: 12

value of a: 13

value of a: 14

value of a: 16

value of a: 17

value of a: 18

value of a: 19

value of a: 20

## Exercise

- Q/ Write m-file in Matlab program to print the square of even numbers for the interval (0-20) , and using one decimal format with while loop.
- Q/ Write a program .m script file to test a number, when the number is 1, print the number is positive when the number is 0, print the number is zero, when the number is -1, print the number is negative. For all other numbers, print unknown using if statement.
- Q/ Write m-file in Matlab program to print the square of odd numbers for the interval (1-20) and using one decimal format with for loop.
- Q/ Write a program .m script file to test a number, when the number is 1, print the number is positive when the number is 0, print the number is zero, when the number is -1, print the number is negative. For all other numbers, print unknown using switch statement.
- Q/ write m-file in matlab program to compute the factorial **W** using while loop.
- Q/ write m-file in matlab program to compute the factorial **W** using for loop.
- Q/Write a program to calculate the average value of a student degrees of seven subjects, then print this average value using for loop.
- Q/ Write a program to calculate the average value of student degrees of three subjects, then print this average value using while loop.

**Q/** Write a program to calculate the production table using for loop.

**Q/** Write m-file in Matlab program to print of even number using one decimal format with if statement.

**Q/** Write m-file in Matlab program to print of even number using one decimal format with switch statement.

**Q/** Write m-file in Matlab program to print of numbers from (1-20) using three decimal format with for loop.

**Q/** Write m-file in Matlab program to print of numbers from (1-20) using three decimal format with while loop.

**Q/** Write m-file in Matlab program to print the square numbers (5-15) by step two and using two decimal format with while loop.

**Q/** Write m-file in Matlab program to print the square numbers (5-15) by step two and using two decimal formats with for loop.

**Q/** Write a program .m script file to test a days, when the day is Friday, print ' the day is off ' when the day is Saturday, print 'the day is off', and otherwise days, print ' you must go to college today' using if statement.

**Q/** Write a program .m script file to test a days, when the day is Friday, print ' the day is off ' when the day is Saturday, print 'the day is off', and otherwise days, print ' you must go to college today' using switch statement.

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**م.م هندا ابراهيم محمد**

س/ اكتب برنامج بماتيابل لايآاد مساحة الدائرة؟

```
r=input('enter the value of r');
m=r^2*pi;
disp('the value of m is =');
disp(m)
```

.....

س/ اكتب برنامج بماتيابل لايآاد محيط الدائرة؟

```
r=input('enter the value of r');
c=2*r*pi;
disp('the value of c is =');
disp(c)
```

.....

س/ اكتب برنامج بماتيابل لايآاد مساحة ومحيط المربع؟

```
w=input('enter the value of w');
m=w*w
c=w*4;
disp('the value of m is =');
disp(m);
disp('the value of c is =');
disp(c)
```

.....

س/ اكتب برنامج بماتيابل لايآاد مساحة ومحيط المستطيل؟

```
w=input('enter the value of w');
r=input('enter the value of r');
m=w*r;
c=(w+r)*2;
disp('the value of m is =');
disp(m);
disp('the value of c is =');
disp(c)
```

.....

س/ حل المعادلة التالية :  $y = 3x^2 + 5c - 4$

```
x=input('enter the value of x');
c=input('enter the value of c');
y=3*x^2+5*c-4
disp('the value of y is =');
disp(y);
```

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م.م هءء ابراهلم مءمء

```
Q1/ y1= 3*a^3+4*b^2+ c-3
y2= 7*a^3- 5*b^2+2* c- 4
y3=c+b
y=y1+y2^2*y3- y1
a=input('enter the value of a');
b=input('enter the value of b');
c=input('enter the value of c');
y1= 3*a^3+4*b^2+c-3;
y2= 7*a^3- 5*b^2+2* c- 4;
y3=c+b ;
y=y1+y2^2*y3- y1;
disp('the value of y1 is =');
disp(y1);
disp('the value of y2 is =');
disp(y2);
disp('the value of y3 is =');
disp(y3);
disp('the value of y is =');
disp(y)
```

input ( بدون )

```
a=5
b=10;
c=20;
d=70;
y1= 3*a^3+4*b^2+c-3;
y2= 7*a^3- 5*b^2+2* c- 4;
y3=c+d;
y=y1+y2^2*y3- y1;
disp('the value of y1 is =');
disp(y1);
disp('the value of y2 is =');
disp(y2);
disp('the value of y3 is =');
disp(y3);
disp('the value of y is =');
disp(y)
```

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م.م هند ابراهيم محمد

المجموعة الثانية

هذه البرامج خاصة باستخدام الـ if statement

س1/ برنامج اختبار العدد هل هو موجب او سالب ؟ بطريقتين اما استخدام if مرتين بشرطين او else ...if

```
x=input('enter the value of x');
if x>=0 disp('the number is postive')
else
 disp('the number is negative')
end
```

```
x=input('enter the value of x');
if x>=0
 disp('the number is postive')
end
if x<0
 disp('the number is negative')
end
```

س2/ برنامج اختبار هل العدد زوجي ام فردي even or odd ؟

```
x=input('enter the value of x');
if mod(x,2)==0
 disp('the number is even')
else disp('the number is odd')
end
```

\*\*\*\*\*

```
x=input('enter the value of x');
if mod(x,2)~=0
 disp('the number is odd')
else disp('the number is even')
end
```

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س3/ برنامج اختبار قابليات القسمة باستخدام شرط مركب باستخدام الـ & and و | بمعنى or .

```
x=input('enter the value of x');
y=input('enter the value of y');
if mod(x,2)==0& mod(x,3)==0
 disp('the number is div by 2 & 3')
else disp('the number is not div by 2 & 3')
end
```

\*\*\*\*\*

```
x=input('enter the value of x');
y=input('enter the value of y');
if mod(x,2)==0|mod(x,3)==0
 disp('the number is div by 2 & 3')
else disp('the number is not div by 2 & 3')
end
```

س4/ برنامج اختبار قابليات القسمة عدد على عدد اخر باستخدام بشروط مركب باستخدام الـ & and و | بمعنى

or وبطريقتين

```
x=input('enter the value of x');
y=input('enter the value of y');
if mod(x,y)==0& mod(y,2)==0
 disp('the number is div by another number')
else disp('the number is not div by another number')
end
```

\*\*\*\*\*

```
x=input('enter the value of x');
y=input('enter the value of y');
if mod(x,y)==0|mod(y,2)==0
 disp('the number is div by another number')
else disp('the number is not div by another number')
end
```

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م.م هند ابراهلم مآمد

المآموعة الثانية

س5/ برنامآ ابلآاء قلم معادلأاء بعد أنفلذ شروط مآآلفة؟

```
x=input('enter the value of x');
y=input('enter the value of y');
w=input('enter the value of w');
if mod(x,y)==0
 c= x^2+3*y+w-4;
 disp('the value of c is');
 disp(c);
end
if mod(x,2)==0
 d=2* x^3+y+5*w;
 disp('the value of d is');
 disp(d);
else n=x+y^4-4*w+6;
 disp('the value of n is');
 disp(n)
end
```

س6/ برنامآ ابلآاء قلم معادلأاء بعد أنفلذ شروط مآآلفة؟

```
x=input('enter the value of x');
y=input('enter the value of y');
w=input('enter the value of w');
if x>2
 c= x^2+3*y+w-4;
 disp('the value of c is');
 disp(c);
end
if y<=3
 d=2* x^3+y+5*w;
```

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م.م هند ابراهيم محمد

المجموعة الثانية

```
disp('the value of d is');
```

```
disp(d);
```

```
else n=x+y^4-4*w+6;
```

```
disp('the value of n is');
```

```
disp(n)
```

```
end
```

.....

س7/اكتب برنامج بلغة MATLAB لايآاد القيمة العظمى من بين ثلاث قيم نأخلها للبرنامج

باستأءام M-file Function

```
a=input('enter the value of a');
```

```
b=input('enter the value of b');
```

```
c=input('enter the value of c');
```

```
if a > b
```

```
max = a ;
```

```
if c > max
```

```
max = c ;
```

```
end
```

```
else
```

```
max = b ;
```

```
if c > max
```

```
max = c ;
```

```
end
```

```
end
```

```
disp('the max number is =')
```

```
disp(max)
```

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س8/اكتب برنامج بلغة MATLAB لايآاد القيمة الصغرى من بين ثلاث قيم نآخلها للبرنامج باسآآام

Function M-file

```
a=input('enter the value of a');
```

```
b=input('enter the value of b');
```

```
c=input('enter the value of c');
```

```
if a < b
```

```
min = a ;
```

```
if c < min
```

```
max = c ;
```

```
end
```

```
else
```

```
min = b ;
```

```
if c < min
```

```
min = c ;
```

```
end
```

```
end
```

```
disp('the min number is =')
```

```
disp(min)
```

.....

## برامج ماتيابل : مرحلة ثانية – قسم الرياضيات / كلية تربية المقداد

م.م هند ابراهيم محمد

المجموعة الثالثة

هذه البرامج خاصة باستخدام الـ for statement

س1/ برنامج يجمع الاعداد من 0 الى 10 متسلسلة

```
s=0 ;
for i = 1 : 10
s=s+i ;
end
disp ('the sum of number is =')
disp (s)
```

.....  
س2/ برنامج يجمع الاعداد الزوجية من 0 الى 10 متسلسلة

1- الطريقة الاولى والاسهل

```
s=0 ;
for i = 0:2 : 10
s=s+i ;
end
disp ('the sum of number is =')
disp (s)
```

2- الطريقة الثانية اذا طلب استخدام if & for معا

```
s=0 ;
for i = 0: 10
 if mod(i,2)==0
s=s+i ;
 end
end
disp ('the sum of number is =')
disp (s)
```

واذا طلب جمع الاعداد الفردية فقط تغيير الشرط  $\text{mod}(i,2) \sim 0$  ، اما اذا طلب مثلا جمع الاعداد الزوجية

وعرض الاعداد الفردية

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المجموعة الثالثة

فقط تغيير بسيط باضافة `else disp(i)`

```
s=0 ;
for i = 0: 10
 if mod(i,2)==0
s=s+i ;
else disp(i)
 end
end
disp ('the sum of number is =')
disp (s)
```

.....  
س3/ يرنامج يجد ناتج

$$S = \sum_{n=1}^{5000} n$$

```
s=0 ;
for i = 1 : 5000
s=s+i ;
end
disp ('the sum of number is =')
disp (s)
```

ملاحظة : نفس السؤال ممكن نغيره الى الاعداد الزوجية او الفردية او بين كل خمس اعداد : 5: 1 i = 1 for  
5000)

.....  
س4/ يرنامج يجد ناتج

$$S = \sum_{n=1}^{5000} n^2$$

```
s = 0 ;
for n = 1 : 5000
s = s + n ^ 2 ;
end
```

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م.م هند ابراهيم محمد  
المجموعة الثالثة

```
disp ('the sum of number is =')
```

```
disp (s)
```

سؤال الواجب : اكتب برنامج لايجاد ناتج S

س5/ اكتب برنامج بلغة MATLAB لإيجاد مفكوك العدد n!

```
n = input (' the number of factorial = ') ;
```

```
fact = 1 ;
```

```
for i = 1 : n
```

```
fact = fact * i ;
```

```
disp('the value of i=')
```

```
disp (i)
```

```
disp('the value of fact=')
```

```
disp(fact)
```

```
end
```

```
n=input('enter the value of n')
```

س6/ برنامج يكتب اي عبارة ويكررها عدد n من المرات

```
for i = 1 : n
```

```
disp('math department')
```

```
end
```

اما اذا بالسؤال طلب طباعة عبارة 10 مرات نغير فقط بايعاز الـ For

```
for i = 1 : 10
```

```
disp('math department')
```

```
end
```

.....

س7/ اكتب برنامج بماتلاب لايجاد مساحة n من الدوائر ؟

```
n=input('enter the value of n')
```

```
for i = 1 : n
```

برامج ماتلاب : مرحلة ثانية – قسم الرياضيات / كلية تربية المقداد

م.م هند ابراهيم محمد

المجموعة الثالثة

$$S = \sum_{n=1}^{5000} \frac{1}{n^2}$$

r=input('enter the value of r')

m=r^2\*pi;

disp('the value of m is =');

disp(m)

i=i+1

end

اما اذا حدد بالسؤال عدد المرات لا نحتاج الى ادخال n ونكتب قيمة لـ n داخل الـ for مثلا لاربعة دوائر

for i = 1 : 4

r=input('enter the value of r')

m=r^2\*pi;

disp('the value of m is =');

disp(m)

i=i+1

end

الواجب / اعادة حل اسئلة المجموعة الاولى باستخدام الـ for

1- اكتب برنامج بماتلاب لايجاد محيط n من الدوائر ؟

2- اكتب برنامج بماتلاب لايجاد مساحة ومحيط n من المربعات؟

3- اكتب برنامج بماتلاب لايجاد مساحة ومحيط n من المستطيلات ؟

س8/ كتابة برنامج لجمع عدد محدد من القيم العشوائية غير المتسلسلة

sum=0;

for i = 1 : 4

x=input('enter the value of x')

sum=sum+x;

disp('the value of sum is =');

disp(sum);

i=i+1

برامج ماتياب : مرحلة ثانية – قسم الرياضيات / كلية تربية المقداد

م.م هند ابراهيم محمد

المجموعة الثالثة

**end**

اما اذا طلب في السؤال جمع عدد غير محدد من القيم ( n ) اي عدد القيم يعرف عند التنفيذ

sum=0;

n=input('enter the value of n')

**for** i = 1 : n

    x=input('enter the value of x')

    sum=sum+x;

    disp('the value of sum is =');

    disp(sum);

    i=i+1

**end**

برامج ماتلاب : مرحلة ثانية – قسم الرياضيات / كلية التربية المقداد

م.م هند ابراهيم محمد

المجموعة الرابعة

س1 ( اكتب برنامج بلغة MATLAB لحساب المتسلسلات التالية :-

1-  $1^2 + 2^2 + 3^2 + \dots + 1000^2$

2-  $1 - 1/3 + 1/5 - 1/7 + 1/9 - \dots$

3-  $1/(1^2 \cdot 3^2) + 1/(3^2 \cdot 5^2) + 1/(5^2 \cdot 7^2) + \dots$

1-

```
s = 0 ;
for k = 1 : 1000
s = s + k ^ 2 ;
end
display (s)
```

2-

```
s1 = -1 ;
s2 = 0 ;
n = input (' input the number = ')
for m = 1 : 2 : n
s1 = s1 * -1 ;
s2 = s2 + s1 / m ;
end
display (s2)
```

3-

```
m = input (' input the number = ') ;
for i = 3 : 2 : m
s = s + 1 / ((i - 2) ^ 2 * i ^ 2) ;
end
disp (s)
```

س2/ اكتب برنامج لايجاد ناتج المعادلة 1- لـ n من القيم .

$$I = \frac{E}{\sqrt{R^2 + (2\pi\omega L - \frac{1}{2\pi\omega C})^2}}$$

$$i = e / \sqrt{r^2 + (2 * \pi * w * l - (1 / 2 * \pi * w * c)^2)}$$

## برامج ماتيابل : مرآلة ثانية - قسم الرلأضلأ / كلية تربلة المآداد

م.م هندا ابراهل مآمد

المآموعة الرأبعة

```
n= input('enter the value of n=')
for j=1:n
e= input('enter the value of e=')
r= input('enter the value of r=')
w= input('enter the value of w=')
l= input('enter the value of l=')
c= input('enter the value of c=')
i=e/(sqrt (r^2 +(2*pi*w*l-(1/2*pi*w*c)^2)))
disp ('the value of i=')
disp(i)
disp('j=')
disp(j)
end
```

اما اذا كانت قلم مرة واحدة يكون الحل كالتالي

2- عندما تكون قلم e, r, w,l,c عشوائية من اآآلارك

```
e= input('enter the value of e=')
r= input('enter the value of r=')
w= input('enter the value of w=')
l= input('enter the value of l=')
c= input('enter the value of c=')
i=e/sqrt (r^2 +(2*pi*w*l-(1/2*pi*w*c)^2))
disp ('the value of i=')
disp(i)
```

.....

س3/ وابل حل هذه المعادلات الثلاثة لـ n من القلم بثلاث برامج منفصلة وبل اذا كانت القلم مآددة ابلأ ینشر الحل على الكلاس (مشاركة مع صفك)

$$t = x + \frac{b}{3a}$$
$$p = \frac{3ac - b^2}{3a^2}$$
$$q = \frac{2b^3 - 9abc + 27a^2d}{27a^3}.$$

برامج ماتيابل : مرآلة ثانية - قسم الرلأضلأل / كلية تربللة المآلال

م.م هند ابراهلم مآمل

المآموعة الرأبعة

$$y = \begin{cases} x^2 + 3z - 5 & 5 \geq x > 1 \\ x^3 - 4z & x \leq 4 \text{ or } z = 1 \\ 4x^2 + 3z^3 - 5w & 0 \leq w \leq 3 \end{cases} \quad \text{س4 / ابلآال قلم Y ل n من القلم}$$

```
n= input('enter the value of n=');
```

```
for i=1:n
```

```
x= input('enter the value of x=');
```

```
z= input('enter the value of z=');
```

```
w= input('enter the value of w=');
```

```
if (x<=5)& (x>=1)
```

```
 y=x^2+3*z-5
```

```
 disp ('the value of y=')
```

```
disp(y)
```

```
end
```

```
if (x<=4)| (z==1)
```

```
 y=x^3-4*z
```

```
 disp ('the value of y=')
```

```
disp(y)
```

```
end
```

```
if (w>=0)& (w<=3)
```

```
y=4*x^2+3*z^3-5*w
```

```
disp ('the value of y=')
```

```
disp(y)
```

```
end
```

```
end
```

اذا القلم مآآلة بالبرنامآ بدون ال for

```
x=5, z=3, w=0;
```

```
if (x<=5)& (x>=1)
```

```
 y=x^2+3*z-5
```

```
 disp ('the value of y=')
```

```
disp(y)
```

```
end
```

```
if (x<=4)| (z==1)
```

```
 y=x^3-4*z
```

```
 disp ('the value of y=')
```

```
disp(y)
```

```
end
```

```
if (w>=0)& (w<=3)
```

```
y=4*x^2+3*z^3-5*w
```

```
disp ('the value of y=')
```

```
disp(y)
```

```
end
```

```
end
```