Class_Work_01/02

Contents

General

```
clear , clc, format compact
```

round - round to nearst integer

```
x=1.5
y1=round(x)
y2=round(-x)
```

```
x =
    1.5000
y1 =
     2
y2 =
    -2
```

fix - round toward zero

```
y3=fix(x)
y4=fix(-x)
```

```
y3 =
     1
y4 =
    -1
```

ceil - round toward infinity

```
y5=ceil(x)
y6=ceil(-x)
```

```
y5 =
     2
y6 =
    -1
```

floor - round toward minus infinity

```
y7=floor(x)
y8=floor(-x)
```

```
y7 =
     1
y8 =
    -2
```

How to round to n digits after the decimal digit

```
clc
format long
number=pi
n=3
round_number=round(number*10^n)/(10^n)
```

```
number =
   3.141592653589793
n =
     3
round_number =
   3.142000000000000
```

cd/pwd - navigating directories

dir - displays the files within the directory

who - lists workspace variables

whos - lists workspace variables and details

mkdir - generate a new folder

Use -+./.* value from Matlab editor cell toolbar

```
n=4
```

```
y=sin(pi/(2*n))
```

```
n =
     4
y =
   0.382683432365090
```

Assign vectors

```
format short
d_row=[4, 22, pi 4.11]
d_col=[1; 22; n/100; pi/2]
```

```
d_row =
    4.0000   22.0000    3.1416    4.1100
d_col =
    1.0000
   22.0000
    0.0400
    1.5708
```

Transpose using '

```
d_row_n=d_row' %
d_col_n=d_col'
```

```
d_row_n =
    4.0000
   22.0000
    3.1416
    4.1100
d_col_n =
    1.0000   22.0000    0.0400    1.5708
```

Chap 2, Exs 1-2

```
x1= [32 4 81 exp(2.5) 63 cos(pi/8) 14.2] % row vector
x2=[55 14 log(51) 987 0 5*sin(2.5*pi)]'  %column vector
```

```
x1 =
   32.0000    4.0000   81.0000   12.1825   63.0000    0.9239   14.2000
x2 =
   55.0000
   14.0000
    3.9318
  987.0000
         0
    5.0000
```

length> Length of vector

```
f2=length(d_col)
```

```
f2 =
     4
```

size>Array dimensions

```
[l m]=size(d_row)
```

```
l =
     1
m =
     4
```

Matrices

```
clc
m1=[1, 4, pi; 8,1/5, 0]
m2=m1'
```

```
m1 =
    1.0000    4.0000    3.1416
    8.0000    0.2000         0
m2 =
    1.0000    8.0000
    4.0000    0.2000
    3.1416         0
```

Build Vectors and Matrices from smaller Vectors and Matrices

```
clc
r1=[4 ,5, pi]'
m12r1=[m1 ; m2  r1]
```

```
r1 =
    4.0000
    5.0000
    3.1416
m12r1 =
    1.0000    4.0000    3.1416
    8.0000    0.2000         0
    1.0000    8.0000    4.0000
    4.0000    0.2000    5.0000
    3.1416         0    3.1416
```

Equally spaced elements:

```
%a:n:b;   a=first, n=increment, b=upper limit, default n=1
x=1:55
x2=1.1:5
x3=1:3:26
```

```
x =
  Columns 1 through 14
     1     2     3     4     5     6     7     8     9    10    11    12    13    14
  Columns 15 through 28
    15    16    17    18    19    20    21    22    23    24    25    26    27    28
  Columns 29 through 42
    29    30    31    32    33    34    35    36    37    38    39    40    41    42
  Columns 43 through 55
    43    44    45    46    47    48    49    50    51    52    53    54    55
x2 =
    1.1000    2.1000    3.1000    4.1000
x3 =
     1     4     7    10    13    16    19    22    25
```

chap 2, Ex-4

```
x4=(15:-5:-25)'
size (x)
```

```
x4 =
    15
    10
     5
     0
    -5
   -10
   -15
   -20
   -25
ans =
     1    55
```

linspace(a,b,n)

```
%a=first, b=last, n=number of elements, n=100 default
g1=linspace(6.6,12,8)
```

```
g1 =
    6.6000    7.3714    8.1429    8.9143    9.6857   10.4571   11.2286   12.0000
```

Chap 2, Ex-5

```
g2=linspace (7,40,15)
g3=size(g2)
```

```
g2 =
  Columns 1 through 8
    7.0000    9.3571   11.7143   14.0714   16.4286   18.7857   21.1429   23.5000
  Columns 9 through 15
   25.8571   28.2143   30.5714   32.9286   35.2857   37.6429   40.0000
g3 =
     1    15
```

Chap 2, Ex-8

```
B=[1:3:25; linspace(72,24,9);0:0.125:1] %or
B=[ linspace(1,25,9); linspace(72,24,9); linspace(0,1,9)]
```

```
B =
  Columns 1 through 8
    1.0000    4.0000    7.0000   10.0000   13.0000   16.0000   19.0000   22.0000
   72.0000   66.0000   60.0000   54.0000   48.0000   42.0000   36.0000   30.0000
         0    0.1250    0.2500    0.3750    0.5000    0.6250    0.7500    0.8750
  Column 9
   25.0000
   24.0000
    1.0000
B =
  Columns 1 through 8
    1.0000    4.0000    7.0000   10.0000   13.0000   16.0000   19.0000   22.0000
   72.0000   66.0000   60.0000   54.0000   48.0000   42.0000   36.0000   30.0000
         0    0.1250    0.2500    0.3750    0.5000    0.6250    0.7500    0.8750
  Column 9
   25.0000
   24.0000
    1.0000
```

Matrix indexes

```
%A(m,n)- m- vector indices of rows, n- vector indices of columns
```

Extract a single element from an array

```
B12=B(1,2)
```

```
B12 =
     4
```

Extract a vector from an array

```
B_row1=B(1,:)
B_col3=B(:,3)
%In order to extract several elements in line 2  use "ns:ne" instead of
%column indices:
B2_24=B(2,2:4)
%In order to extract all elements in a column
B_all=B(:)
B_fifth_element=B(5)
```

```
B_row1 =
     1     4     7    10    13    16    19    22    25
B_col3 =
    7.0000
   60.0000
    0.2500
B2_24 =
    66    60    54
B_all =
    1.0000
   72.0000
         0
    4.0000
   66.0000
    0.1250
    7.0000
   60.0000
    0.2500
   10.0000
   54.0000
    0.3750
   13.0000
   48.0000
    0.5000
   16.0000
   42.0000
    0.6250
   19.0000
   36.0000
    0.7500
   22.0000
   30.0000
    0.8750
   25.0000
   24.0000
    1.0000
B_fifth_element =
    66
```

Chap 2, Ex-9

```
A=[6 43 2 11 87; 12 6 34 0 5; 34 18 7 41 9]
va=A(2,:)
vb=A(:,4)'  %row vector
vc=[A(1,:),A(2,:)]
vd=[A(:,2);A(:,5)]'   %or vd=[A(:,2)',A(:,5)']
```

```
A =
     6    43     2    11    87
    12     6    34     0     5
    34    18     7    41     9
va =
    12     6    34     0     5
vb =
    11     0    41
vc =
     6    43     2    11    87    12     6    34     0     5
vd =
    43     6    18    87     5     9
```

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