Pengenalan MATLAB / OCTAVE

Praktikum Metode Numerik 2022

VARIABLE

```
>> a = 3;
>> b = 7
>> c = a + b;
>> c + b
```

Command Window

```
>> a = 3;
>> b = 7

b =

     7

>> c = a + b;
>> c

c =

    10

>> c + b

ans =

    17
```

OPERASI

Penjumlahan

>> a = 5;

>> b = 10;

>> c = a + b

Pengurangan

>> x = 9;

>> y = 4;

>> z = x - y

Command Window

```
>> a = 5;
>> b = 10;
>> c = a + b

c =

    15

>> x = 9;
>> y = 4;
>> z = x - y

z =

     5
```

Perkalian

>> a = 7;

>> b = 3;

>> c = a * b

Pembagian

>> x = 48;

>> y = 60;

>> z = x / y

>> x \ y

Command Window

```
>> a = 7;
>> b = 3;
>> c = a * b

c =

    21

>> x = 48;
>> y = 60;
>> z = x / y

z =

    0.8000

>> x\y

ans =

    1.2500
```

OPERASI

Modulo

>> x=21

>> y=5

>> mod(x,y)

```
>> x=12
x = 12
>> y=5
y = 5
>> mod(x,y)
ans = 2
```

Increment dan Decrement

>> x=1

>> ++x

>> x--

```
x = 1
>> ++x
ans = 2
>> x--
ans = 2
>> x
x = 1
```

Shorthand

>> y=3

>> y+=5

>> y/=4

```
>> y=3
y = 3
>> y+=5
y = 8
>> y/=4
y = 2
```

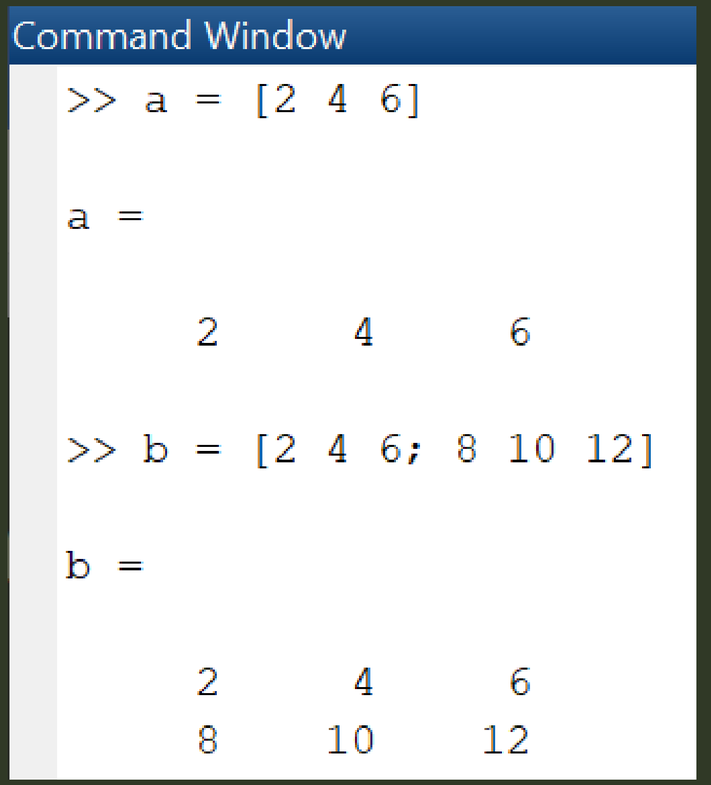
ARRAY MATRIKS

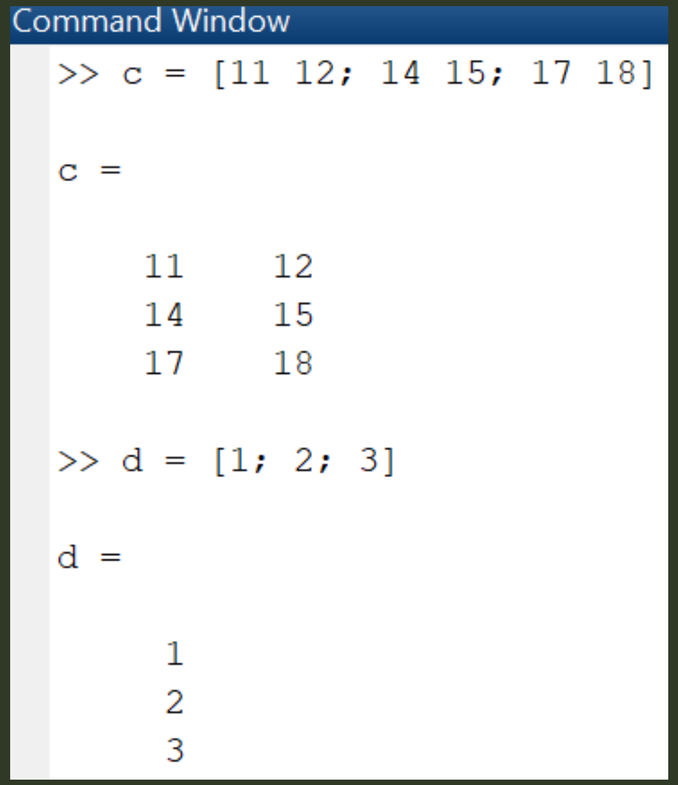
>> a = [2 4 6]

>> b = [2 4 6; 8 10 12]

>> c = [11 12; 14 15; 17 18]

>> d = [1; 2; 3]





OPERASI MATRIKS

Command Window

```
>> a = [1 3 5 7; 2 4 6 8; 3 6 9 0]

a =

     1     3     5     7
     2     4     6     8
     3     6     9     0

>> x = [2 3];
```

>> a = [1 3 5 7; 2 4 6 8; 3 6 9 0]

>> x = [2 3];

>> b = a(x,2)

>> c = a(2,x)

Command Window

```
>> b = a(x,2)

b =

     4
     6

>> c = a(2,x)

c =

     4     6
```

Command Window

```
>> d = a(x,:)

d =

     2     4     6     8
     3     6     9     0

>> e = a(:,x)

e =

     3     5
     4     6
     6     9
```

>> d = a(x,:)

>> e = a(:,x)

OPERASI MATRIKS

```
>> a = [1 3 5 7; 2 4 6 8; 3 6 9 0]

a =

     1     3     5     7
     2     4     6     8
     3     6     9     0

>> x = [2 3];
```

>> f = zeros(4)

>> f(1:2,:) = a(x,:)

Command Window

```
>> f = zeros(4)

f =

     0     0     0     0
     0     0     0     0
     0     0     0     0
     0     0     0     0

>> f(1:2,:) = a(x,:)

f =

     2     4     6     8
     3     6     9     0
     0     0     0     0
     0     0     0     0
```

>> g = ones(3)

>> g(1:2, 2:3) = a(2:3, 3:4)

Command Window

```
>> g = ones(3)

g =

     1     1     1
     1     1     1
     1     1     1

>> g(1:2, 2:3) = a(2:3,3:4)

g =

     1     6     8
     1     9     0
     1     1     1
```

>> h = rand(3,4)

>> h(:,3) = a(:,1)

Command Window

```
>> h = rand(3,4)

h =

    0.9572    0.1419    0.7922    0.0357
    0.4854    0.4218    0.9595    0.8491
    0.8003    0.9157    0.6557    0.9340

>> h(:,3) = a(:,1)

h =

    0.9572    0.1419    1.0000    0.0357
    0.4854    0.4218    2.0000    0.8491
    0.8003    0.9157    3.0000    0.9340
```

OPERASI MATRIKS

Command Window

```
>> x = [4 5 6; 6 7 8; 8 9 0];
>> y = [1 2 3; 6 5 4; 7 9 1];
>> z = x*y

z =

    76    87    38
   104   119    54
    62    61    60

>> a = x.*y

a =

     4    10    18
    36    35    32
    56    81     0
```

Command Window

```
>> b = x.^y

b =

           4          25         216
       46656       16807        4096
     2097152   387420489           0

>> c = det(x)

c =

    20

>> d = inv(y)

d =

   -0.4429    0.3571   -0.1000
    0.3143   -0.2857    0.2000
    0.2714    0.0714   -0.1000
```

```
x =

   1   2   3
   4   5   6
   7   8   9

>> x'
ans =

   1   4   7
   2   5   8
   3   6   9

>> y=[10 11 12]
y =

   10   11   12

>> y'
ans =

   10
   11
   12
```

OPERASI MATRIKS

```
>> 1:5
ans =

   1   2   3   4   5

>> 1:2:5
ans =

   1   3   5

>> 1:.5:5
ans =

    1.0000    1.5000    2.0000    2.5000    3.0000    3.5000    4.0000    4.5000    5.0000
```

INPUT OUTPUT

Pada MATLAB, menginput data dapat dengan menggunakan fungsi berikut.

input(‘...’);

Untuk outputnya dapat menggunakan salah satu dari kedua fungsi berikut.

disp();

fprintf(‘...’,[variabel]);

INPUT OUTPUT

InputOutput.m

```
1 -    x = input('Masukkan angka: ');
2 -    fprintf('Anda telah menginput angka');
3 -    disp(x);
```

Command Window

```
>> InputOutput
Masukkan angka: 5
Anda telah menginput angka     5
```

DECISION

Terdapat fungsi **if else** dan **switch** dalam MATLAB

Program IPK

```
x = input('Masukkan nilai IP: ');
if (x >= 85)
    fprintf('Anda dapat A\n');
elseif (x >= 80 & x < 85)
    fprintf('Anda dapat A-\n');
elseif (x >= 75 & x < 80)
    fprintf('Anda dapat B+\n');
elseif (x >= 70 & x < 75)
    fprintf('Anda dapat B\n');
elseif (x >= 65 & x < 70)
    fprintf('Anda dapat C+\n');
else
    fprintf('Anda dapat C\n');
end
```

Program Konversi Suhu

```
x = input('Masukan nilai suhu Celcius : ');
if (x > 100)
    fprintf('Maaf, batas titik didih Celcius 100 derajat Celcius\n');
elseif (x < 0)
    fprintf('Maaf, batas titik beku Celcius 0 derajat Celcius\n');
else
    y = input('Tentukan konversi suhu : ');
    switch (y)
        case 1
            x = 0.8*x;
            fprintf('Sukses konversi ke Reamur. Maka nilai R : %g\n', x);
        case 2
            x = 1.8*x + 32;
            fprintf('Sukses konversi ke Fahrenheit. Maka nilai F : %g\n', x);
        case 3
            x = x + 273;
            fprintf('Sukses konversi ke Kelvin. Maka nilai K : %g\n', x);
        otherwise
            fprintf('Pilihan Anda tidak ada dalam sistem ini');
    end
end
```

tm53cgb