PRAKTIKUM METODE NUMERIK
PERTEMUAN 1

Perkenalan MATLAB

Install MATLAB

Segera install dulu bagi yang belum.

Kalau sudah, nyantai dulu ☺

Untuk versi MATLAB bebas.

SEKARANG SAATNYA NGODING PAKAI MATLAB

Ngoding MATLAB itu mudah lo. Tidak seperti ngoding C, Java, PHP, dll.

So, jangan bosan ya hehe...

VARIABEL

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

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

b =

     7

>> c = a+b;
>> c = a+b

c =

    10

>> a+b

ans =

    10
```

OPERASI

Penjumlahan :

>> a = 6;

>> b = 9;

>> c = a + b;

Pengurangan :

>> x = 9;

>> y = 4;

>> z = x-y;

```
>> a = 6;
>> b = 9;
>> c = a+b

c =

     15

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

z =

      5
```

OPERASI

Perkalian :

>> a = 5;

>> b = 10;

>> c = a*b;

Pembagian :

>> x = 24;

>> y = 36;

>> x/y;

>> x\y;

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

c =

     50

>> x = 24;
>> y = 36;
>> x/y

ans =

    0.6667

>> x\y

ans =

    1.5000
```

ARRAY MATRIKS

```
>> a = [1 2 3]
>> b = [1 2 3; 4 5 6]
>> c = [5 6; 4 3; 2 9]
>> d = [4; 5; 6]
```

```
>> d = [4; 5; 6]

d =

     4
     5
     6
```

```
>> a = [1 2 3]

a =

     1     2     3

>> b = [1 2 3; 4 5 6]

b =

     1     2     3
     4     5     6

>> c = [5 6; 4 3; 2 9]

c =

     5     6
     4     3
     2     9
```

OPERASI MATRIKS

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

>> x = [1 3];

>> b = a(x,2)

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

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

a =

     2     3     4     5
     1     2     3     4
     7     6     5     4

>> x = [1 3];
>> b = a(x,2)

b =

     3
     6

>> c = a(2,x)

c =

     1     3
```

OPERASI MATRIKS

>> d = a(x,:)

>> e = a (:,x)

>> f = zeros(4)

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

>> g = ones(3)

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

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

d =

     2     3     4     5
     7     6     5     4

>> e = a(:,x)

e =

     2     4
     1     3
     7     5
```

```
>> 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     3     4     5
     7     6     5     4
     0     0     0     0
     0     0     0     0
```

```
>> 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     3     4
     1     5     4
     1     1     1
```

OPERASI MATRIKS

>> h = rand(3,4)

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

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

h =

    0.8147    0.9134    0.2785    0.9649
    0.9058    0.6324    0.5469    0.1576
    0.1270    0.0975    0.9575    0.9706

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

h =

    0.8147    0.9134    2.0000    0.9649
    0.9058    0.6324    1.0000    0.1576
    0.1270    0.0975    7.0000    0.9706
```

Dalam Operasi Matriks, ada 3 operasi spesifikasi matriks :

1. Zeros
2. Ones
3. Random

OPERASI MATRIKS

```
x = [4 5 6; 6 7 8; 8 9 0];
y = [1 2 3; 6 5 4; 7 9 1];
z = x*y
a = x.*y
b = x.^y
c = det(x)
d = inv(y)
```

INPUT OUTPUT

Dalam MATLAB dapat menginput data dengan menggunakan fungsi :

input('...');

Untuk outputnya dapat menggunakan dua fungsi

disp();

fprintf('...',[variabel])

INPUT OUTPUT

InputOutput.m

```
x = input('Masukan angka : ');
fprintf('Anda telah menginput angka ');
disp(x);
```

Command Window

New to MATLAB? See resources for Getting Started.

```
>> InputOutput
Masukan angka : 3
Anda telah menginput angka       3
```

DECISION

Dalam MATLAB mengenal fungsi *if else* dan *switch.*

Misalkan :

Program IPK

Program Konversi Suhu

DECISION

Program IPK

```
x = input ('Masukan 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
```

DECISION

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
```

LOOPING

Dalam MATLAB mengenal *for* dan *while do*

```
% Looping for kondisi 1
for i = 1:5
    p = i^2
end

% Looping for kondisi 2
for j = 1:0.5:5
    q = j/2
end
```

```
p = 0;
while(p <= 10)
    q = p^2 + p
    p = p + 1;
end
```

FINISH

Any Question ?