FOR

The for loop executes a statement or group of statements a predetermined number of times. Its syntax is ;

```
for index = start:increment:end
   statements
end
```

Ex1-) To find value of a function in any interval or points, (To create a vector)

```
for  i=1:1:6      %  i=1:6
   x(i)= 2*(i^2)+3*i+5;
end
```

Ex2-)

```
 for  i=1:2:9
   x(i)= 2*(i^2)+3*i+5;
end

% x(2), x(4), x(6), x(8) will be zero
```

Ex3-) To create an A matrix with a_{ij}= 1/(i+j-1)

```
for  i=1:5
   for j=1:8
      A(i,j)= 1/(i+j-1);
  end
end
```

Ex4-) The for loop may executes a group of statements

```
k=0
for  i=1:5
   x(i)= 2*(i^2)+3*i+5;
   for j=1:8
      A(i,j)= 1/(i+j-1);
      k=k+1;
     y(k)=2*k/i;
  end
  z(k)= 2*k/i;
end
```

WHILE

The while loop executes a statement or group of statements repeatedly as long as the controlling expression is true (1). Its syntax is

```
while expression
   statements
end
```

Ex1-) To find value of a function in any interval or points, (To create a vector)

```
i=1
while  i<=6
    x(i)= 2*(i^2)+3*i+5;
       i=i+1;
end
```

Ex2-) To have logical expressions

```
a= [1 -1 2 5 0 -3 6 7 5 2];
b= [0 -3 4 1 -5 2 6 5 8 7];
i=1;
toplam=0

while a(i)*b(i)>=0 &&  i<11
      toplam=toplam+a(i)*b(i);
         i=i+1;
end
```

Ex3-) To create an A matrix with a_{ij}= 1/(i+j-1)

```
 i=0;
j=0;
while  i<=5
   i=i+1;
   while j<=8
      j=j+1;
      A(i,j)= 1/(i+j-1);
  end
  j=0;
end
```

IF

Execute statements if condition is true

```
if expression
   statements
end
```

Other type ,

```
if expression1
   statements1
elseif expression2
   statements2
else
   statements3
end
```

Ex1-)

```
a=3;
if a==3
    b=4;
else
    b=6;
end
```

Ex2-)

```
a=3;
if a==3
    b=4;
end

if   a=5
    b=6;
end
```

Ex3-)

```
a=3; c=6;
if a==3
     if c==4
        b=5;
    else
        b=3;
    end
end
```

Ex4-)

```
a=3; b=6; c=-1;
if a*b>=10 && c>0
    d=2;
elseif a*b>=10 && c<0
    d=5;
else
    d=0;
end
```

A Problem to use for, while and if …

```
clear all
for t=1:25
    if t==1
        x(t)=2;
    elseif 5>=t && t>1
        x(t)=2*t/5;
    elseif 10>=t && t>5
        x(t)=cos(pi/t);
    elseif 25>=t && t>10
        n=0;
        toplam=0;
        while n<=10
            n=n+1;
            toplam=toplam+sin(pi/n)*5/t;
        end
        x(t)=toplam;
    end
    if t>10

       if x(t)/x(t-1)<=1
           break
       end
    end
end

plot(x)
```