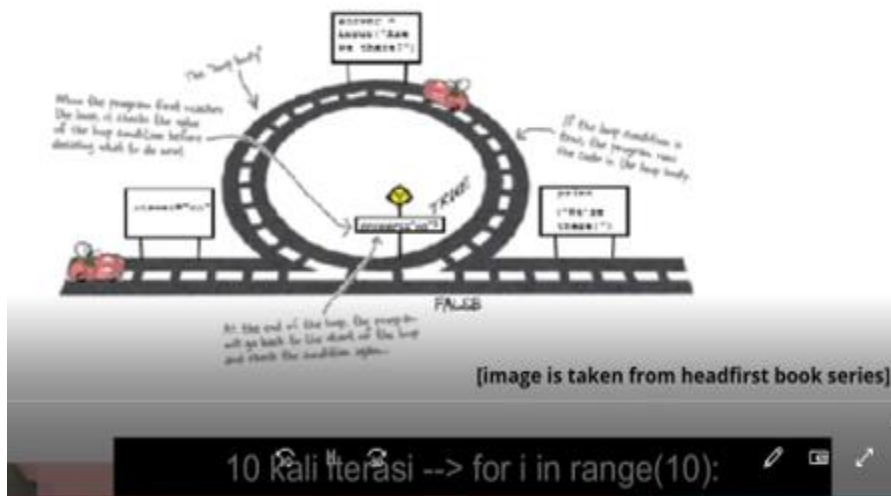


For utk iterasi yg diketahui jmh perulangannya

## Iterasi - Loop

### Loop, Iteration, Repetition



Jumlah iterasi yg tdk diketahui dg while.

## Iterasi - Loop

### Loop, Iteration, Repetition

Number of Iteration : unknown

```
Initialize_condition
while condition_is_True:
    Syntax_1
    Syntax_2
    ...
    Syntax_n
    stopping_Condition
```

Note : Do not forget to stop the iteration by making the condition False (stopping condition)

## while

```
In [1]: ► while i<=5: I
          print(i)

-----
NameError                                Traceback (most recent call last)
<ipython-input-1-2a78c638dba4> in <module>
----> 1 while i<=5:
      2     print(i)

NameError: name 'i' is not defined
```

```
In [1]: ► 1 i=0
          2 while i<=5:
          3     print(i)
```

Supaya python bs eksekusi syntax while maka sbkm while harus diberi inisialisai, misal  $i = 0$ .

## while

```
In [2]: ► 1 i=6 I
          2 while i<=5:
          3     print(i)
          4     print('end of while')

end of while
```

Krn loop condition:  $6 \leq 5$  bernilai False, maka iterasi tidak akan dieksekusi baris ke 3 dst.

## while

```
In [*]: ► 1 i=0
          2 while i<=5:
          3     print(i)
          4     print('end of while')
```

0 terus diprint tdk berhenti..atau terjadi error/hang. Karena tdk ada stopping condition shg mnycabkan loop condition bernilai False.

```
In [*]: 1 i=0
2 while i<=5:
3     print(i)
4     print('end of while')
```

**variabel i selalu bernilai 'not'**  
**Loop Condition akan selalu True**

Sehingga diperlukan stopping condition.

1. Stopping condition yang ada di dalam coding.

**while**

```
In [ ]: 1 i=0
2 while i<=5:
3     print(i)
4     i=i+1
5     print('end of while')
```

$i=0, 0 \leq 5 : \text{True}$

$i=1, 1 \leq 5 : \text{True}$

$i=2, 2 \leq 5 : \text{True}$

...

$i=6, 6 \leq 5 : \text{False}$

iterasi berhenti

Jika kondisi True dilakukan iterasi baris 3&4, Kalo sdh bernilai False, maka langs menuju baris ke 5.

**while**

```
In [1]: 1 i=0
2 while i<=5:
3     print(i)
4     i=i+1
5     print('end of while')
```

```
0
1
2
3
4
5
end of while
```

```
In [2]: 1 i=0
2 while i<=5:
3     print(i)
4     #i=i+1
5     i+=1
6     print('end of while')
```

```
0
1
2
3
4
5
end of while
```

```
In [3]: 1 i=0
2 while i<5:
3     print(i)
4     #i=i+1
5     i+=1
6     print('end of while')
```

```
0
1
2
3
4
end of while
```

```
In [4]: i=0
        while i<=5:
            if i%2==1:
                print(i)
            #i=i+1
            i+=1
        print('end of while')

1
3
5
end of while
```

```
In [5]: bilangan=0
        counter=1
        while counter<=5:
            if bilangan%2==1:
                print('bilangan ganjil-',counter,'=',bilangan)
                counter+=1
            bilangan+=1
        print('end of while')

bilangan ganjil- 1 = 1
bilangan ganjil- 2 = 3
bilangan ganjil- 3 = 5
bilangan ganjil- 4 = 7
bilangan ganjil- 5 = 9
end of while
```

```
In [6]: bilangan=0
        counter=1
        while counter<=10:
            if bilangan%2==1:
                print('bilangan ganjil-',counter,'=',bilangan)
                counter+=1
            bilangan+=1
        print('end of while')

bilangan ganjil- 1 = 1
bilangan ganjil- 2 = 3
bilangan ganjil- 3 = 5
bilangan ganjil- 4 = 7
bilangan ganjil- 5 = 9
bilangan ganjil- 6 = 11
bilangan ganjil- 7 = 13
bilangan ganjil- 8 = 15
bilangan ganjil- 9 = 17
bilangan ganjil- 10 = 19
end of while
```

2. Stop condition berasal dari input user

```
In [ ]:  stop=False  
        while not(stop):
```

Not(False) berarti bernilai True

```
In [7]: 1 stop=False  
        2 while not(stop):  
        3     inp=input('lagi (y/t) ? ')  
        4     if inp=='y':  
        5         stop=False  
        6     else:  
        7         stop=True
```

```
lagi (y/t) ? y  
lagi (y/t) ? y  
lagi (y/t) ? y  
lagi (y/t) ? y  
lagi (y/t) ? y  
lagi (y/t) ? y  
lagi (y/t) ? t
```

3. Kondisi1 operatorLogika kondisi2 bisa bernilai True/False

```
In [ ]:  #kondisi 1 --> False  
        #kondisi 2 --> False  
  
        # AND : T and F --> F, F and F --> F  
        # OR  : T or F --> T
```

```

8 stop=False
9 bilangan=0
10 counter=1
11 while counter<=4 and not(stop):
12     if bilangan%2==1:
13         print('Bilangan ganjil-',counter,'=',bilangan)
14         counter+=1
15     else:
16         print('bukan bilangan ganjil')
17     inp=input('lagi (y/t) = ')
18     if inp=='y':
19         stop=False
20     else:
21         stop=True

```

bukan bilangan ganjil  
lagi (y/t) = y  
bukan bilangan ganjil

lagi (y/t) =

```

10 counter=1
11 while counter<=4 and not(stop):
12     if bilangan%2==1:
13         print('Bilangan ganjil-',counter,'=',bilangan)
14         counter+=1
15     else:
16         print('bukan bilangan ganjil')
17     bilangan+=1
18     inp=input('lagi (y/t) = ')
19     if inp=='y':
20         stop=False
21     else:
22         stop=True

```

bukan bilangan ganjil

lagi (y/t) =

't' --> stop=True  
counter<=4 and not(stop) --> 1<=4 and not(True) --> True and False  
akan bernilai False --> iterasi berhenti



```

bukan bilangan ganjil
lagi (y/t) = y
Bilangan ganjil- 1 = 1
lagi (y/t) = y
bukan bilangan ganjil
lagi (y/t) = y
Bilangan ganjil- 2 = 3
lagi (y/t) = y
bukan bilangan ganjil
lagi (y/t) = y
Bilangan ganjil- 3 = 5
lagi (y/t) = y
bukan bilangan ganjil
lagi (y/t) = y
Bilangan ganjil- 4 = 7
lagi (y/t) = y

```

Jika dimasukkan y terus selama 4 kali maka iterasi tetap berhenti, meskipun bukan t yang user masukkan

Contoh dg logika 'and' konversi bilangan desimal ke bilangan biner.

1. Bilangan dimasukkan oleh user dilakukan perintah 'div'

$$\begin{array}{r} 2 \overline{) 6} \phantom{0} \\ \underline{2 \phantom{0}} 3 \phantom{0} \\ \underline{2 \phantom{0}} 1 \phantom{0} \\ \underline{2 \phantom{0}} 0 \phantom{0} \end{array} \Rightarrow 6 \Rightarrow 110$$

$$\begin{array}{r} 2 \overline{) 4} \phantom{0} \\ \underline{2 \phantom{0}} 2 \phantom{0} \\ \underline{2 \phantom{0}} 0 \phantom{0} \\ \underline{2 \phantom{0}} 0 \phantom{0} \end{array} \Rightarrow 4 \Rightarrow 100$$

```

In [11]: 1 bilangan=int(input('masukkan bilangan = '))
          2 hasilDiv=bilangan
          3 while hasilDiv!=0:
          4     hasilDiv=hasilDiv//2
          5     print(hasilDiv)

masukkan bilangan = 6
3
1
0

```

```

In [12]: 1 bilangan=int(input('masukkan bilangan = '))
          2 hasilDiv=bilangan
          3 while hasilDiv!=0:
          4     hasilDiv=hasilDiv//2
          5     print(hasilDiv)

masukkan bilangan = 4
2
1
0

```

Stop condition bias diletakan di deklarasi 'while'

$$\begin{array}{r} 2 \overline{) 10} \\ \underline{2 \phantom{0}} 5 \phantom{0} \\ \underline{2 \phantom{0}} 2 \phantom{0} \\ \underline{2 \phantom{0}} 0 \phantom{0} \\ \underline{2 \phantom{0}} 0 \phantom{0} \end{array}$$

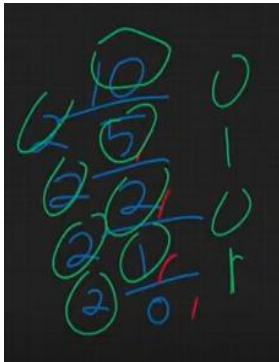
```

In [13]: 1 bilangan=int(input('masukkan bilangan = '))
          2 hasilDiv=bilangan
          3 while hasilDiv!=0:
          4     hasilDiv=hasilDiv//2
          5     print(hasilDiv)

masukkan bilangan = 10
5
2
1
0

```

2. Bilangan juga dilakukan perintah 'mod'. Catatan: yang di 'mod' adalah hasil bagi (div)



```
In [15]: M bilangan=int(input('masukkan bilangan = '))
          hasilDiv=bilangan
          while hasilDiv!=0:
              hasilMod=hasilDiv%2
              hasilDiv=hasilDiv//2
              print(hasilMod)

          masukkan bilangan = 6
          0
          1
          1
```

```
In [16]: M bilangan=int(input('masukkan bilangan = '))
          hasilDiv=bilangan
          while hasilDiv!=0:
              hasilMod=hasilDiv%2
              hasilDiv=hasilDiv//2
              print(hasilMod)

          masukkan bilangan = 4
          0
          0
          1
```

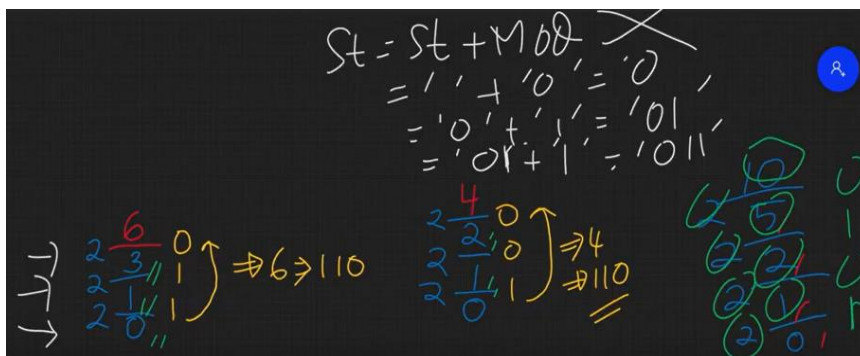
```
In [17]: M bilangan=int(input('masukkan bilangan = '))
          hasilDiv=bilangan
          while hasilDiv!=0:
              hasilMod=hasilDiv%2
              hasilDiv=hasilDiv//2
              print(hasilMod)

          masukkan bilangan = 10
          0
          1
          0
          1
```

3. Membaca hasil konversi desimal ke biner

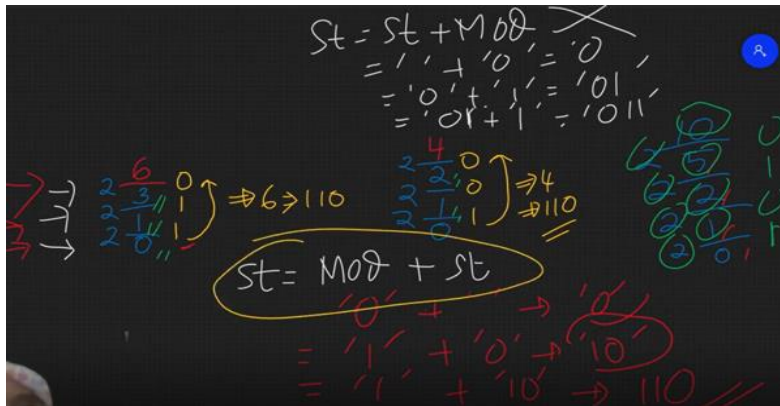
Bagaimana dibaca kebalik dari bawah ke atas?

Kemungkinan 1:





Kemungkinan 2:



```
In [18]: M bilangan=int(input('masukkan bilangan = '))
hasilDiv=bilangan
strBiner=''
while hasilDiv!=0:
    hasilMod=hasilDiv%2
    hasilDiv=hasilDiv//2
    #strBiner=strBiner+str(hasilMod)
    strBiner=str(hasilMod)+strBiner
    print(hasilMod)
print(bilangan,':',strBiner)
```

masukkan bilangan = 6  
0  
1  
1  
6 : 110

```
In [20]: M bilangan=int(input('masukkan bilangan = '))
hasilDiv=bilangan
strBiner=''
while hasilDiv!=0:
    hasilMod=hasilDiv%2
    hasilDiv=hasilDiv//2
    #strBiner=strBiner+str(hasilMod)
    strBiner=str(hasilMod)+strBiner
    print(hasilMod)
print(bilangan,':',strBiner)
```

masukkan bilangan = 10  
0  
1  
0  
1  
10 : 1010

