



**Kampus
Merdeka**
INDONESIA JAYA

ALGORITMA DAN STRUKTUR DATA

Jemy Arieswanto



MATERI

1. Konsep perulangan
2. Pernyataan *while*
3. Pernyataan *do-while*
4. Pernyataan *for*

Perulangan atau perintah *looping* dalam bahasa pemrograman yang biasa kita kenal dipakai untuk melakukan perintah secara berulang-ulang apabila suatu kondisi sudah terpenuhi ataupun sebaliknya.

Dalam praktek di pemrograman komputer, pengulangan biasa dipakai untuk mengulang proses pada perhitungan, mengulang proses input data dan banyak lagi terkait dalam proses pengulangan.



Perintah atau notasi dalam struktur pengulangan adalah :

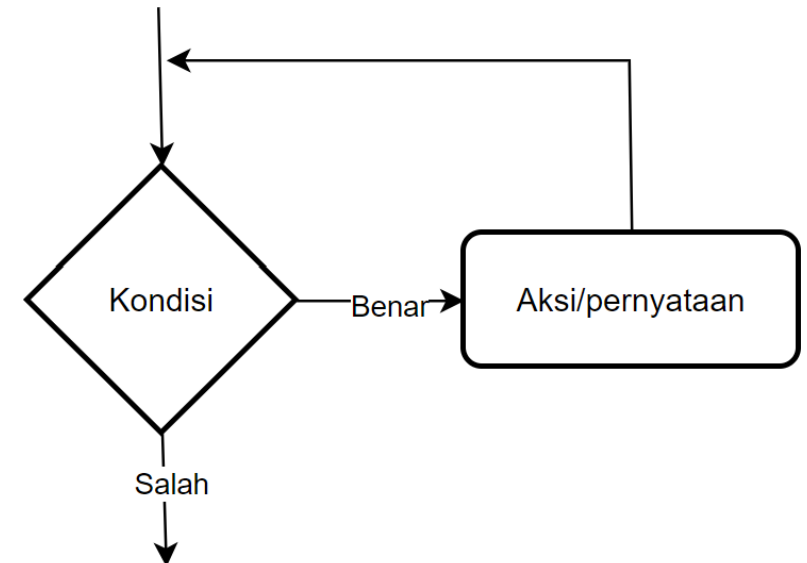
1. Pernyataan *while*
2. Pernyataan *do..while*
3. Pernyataan *for*

PERNYATAAN *while*

Pernyataan *while* merupakan salah satu pernyataan yang berguna untuk memproses suatu pernyataan atau beberapa pernyataan beberapa kali. Pernyataan *while* memungkinkan statemen-statemen yang ada di dalamnya tidak dilakukan sama sekali .

Bentuk Umumnya:

```
while (kondisi)  
{  
    Pernyataan ;  
}
```



Karakteristik perulangan while :

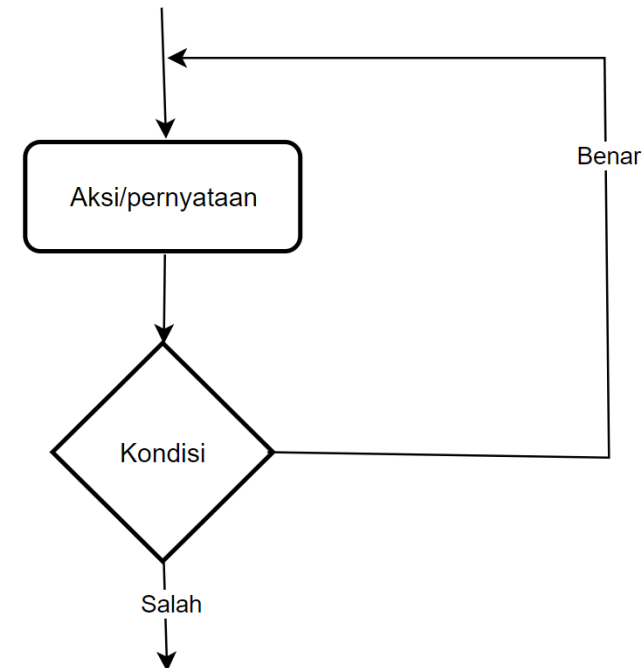
1. Dilakukan pemeriksaan kondisi terlebih dahulu sebelum di lakukan perulangan
2. Perulangan dilakukan terus menerus sampai kondisi FALSE

PERNYATAAN **do...while**

Pernyataan do...while mirip seperti pernyataan while, hanya saja pada do...while pernyataan yang terdapat di dalamnya minimal akan sekali dieksekusi .

Bentuk Umumnya :

```
do
{
    pernyataan ;
} while(kondisi);
```



Karakteristik perulangan *do-while* :

1. Jalankan dulu pernyataan awal tanpa pemeriksaan kondisi
2. lakukan pemeriksaan kondisi untuk melakukan perulangan
3. Perulangan dilakukan terus menerus sampai kondisi FALSE

Perbandingan *while* dengan *do-while*

```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i=12;
7      cout <<"Output while" <<endl;
8      while(i<10) {
9          cout <<"Hello World..." << endl;
10         i++;
11     }
12 }
```

```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i=12;
7      cout <<"Output do-while" <<endl;
8      do {
9          cout <<"Hello World..." << endl;
10         i++;
11     }while(i<10);
12 }
```

Output perbandingan *while* dengan *do-while*

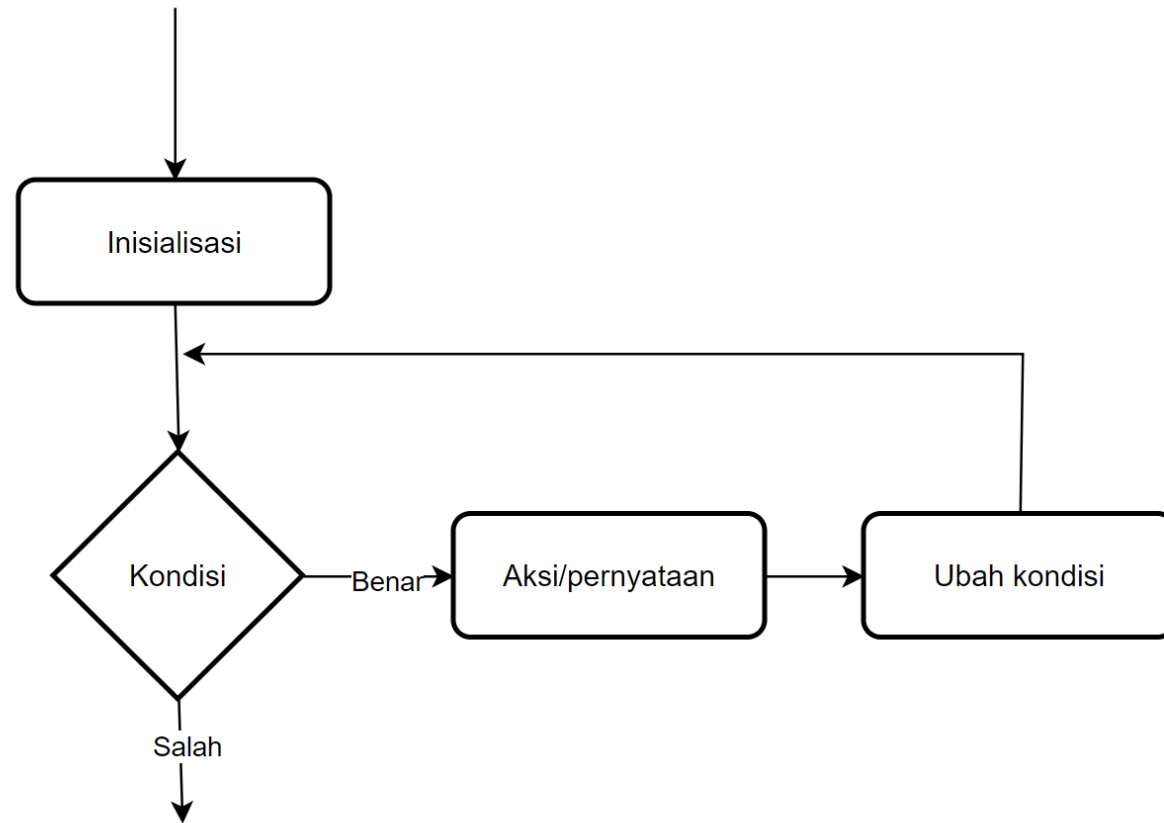
```
G:\My Drive\#ibik.ac.id\Teach × + ▾  
Output while  
-----  
Process exited after 0.5516 seconds with return value 0  
Press any key to continue . . .
```

```
G:\My Drive\#ibik.ac.id\Teach × + ▾  
Output do-while  
Hello World...  
-----  
Process exited after 0.5694 seconds with return value 0  
Press any key to continue . . .
```

FOR adalah salah satu Jenis loop dalam bahasa C++. Instruksi ini dipakai apabila kita sudah mengetahui berapa kali perulangan pernyataan akan dilakukan. contoh dibawah adalah contoh format perulangan FOR:

```
for loop.  
for (initialization; kondisi; rubah_kondisi)  
{  
    Pernyataan1;  
    Pernyataan2;  
    // tempat banyaknya pernyataan  
}
```

Flow chart

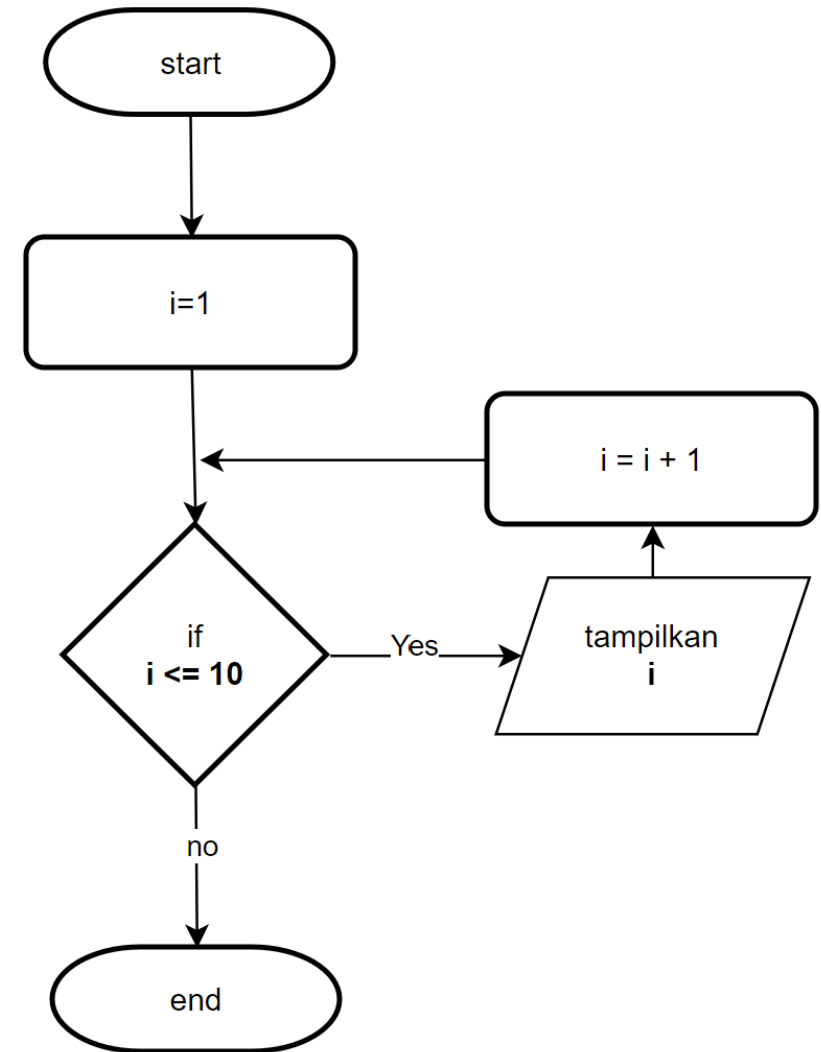


Pernyataan FOR dari flow chart diatas digambarkan sebagai berikut :

- 1) inisialisasi: pernyataan ini biasa dioakai untuk menginisialisasikan untuk pengendalian pengulangan tersebut.
- 2) dalam pengulangan, kondisi dipakai untuk menyatakan dan menentukan apakah proses perulangan akan dilanjutkan atau tidak.
- 3) Ubah_kondisi : tahap ini biasanya digunakan untuk merubah variable dalam pengatur ataupengendali perulangan.

Contoh 1 program *for*

```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          cout<< i <<endl;
10     }
11 }
```

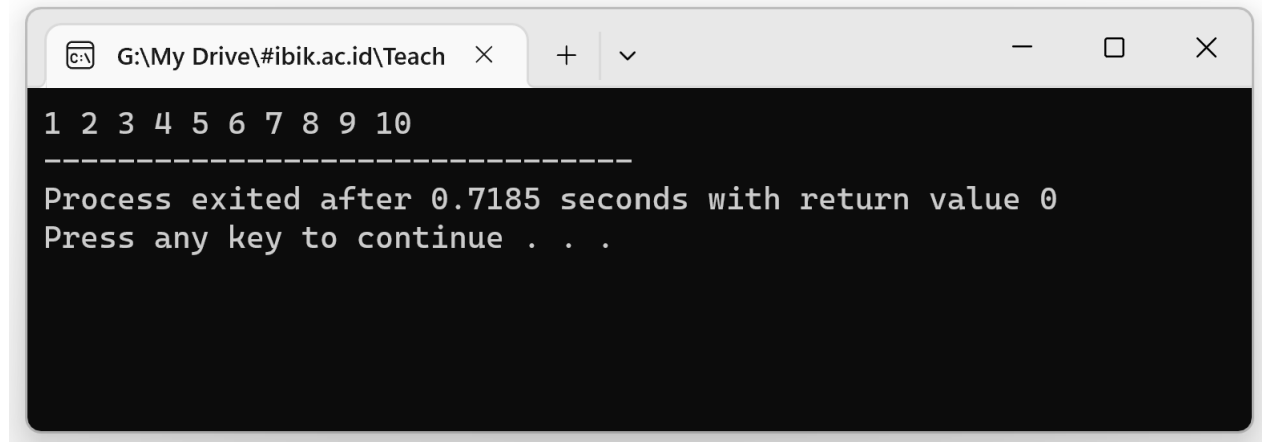


Output contoh 1 program *for*

```
G:\My Drive\#ibik.ac.id\Teach × + ▾ − □ ×  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
  
-----  
Process exited after 0.6599 seconds with return value 0
```

Contoh 2 program *for*

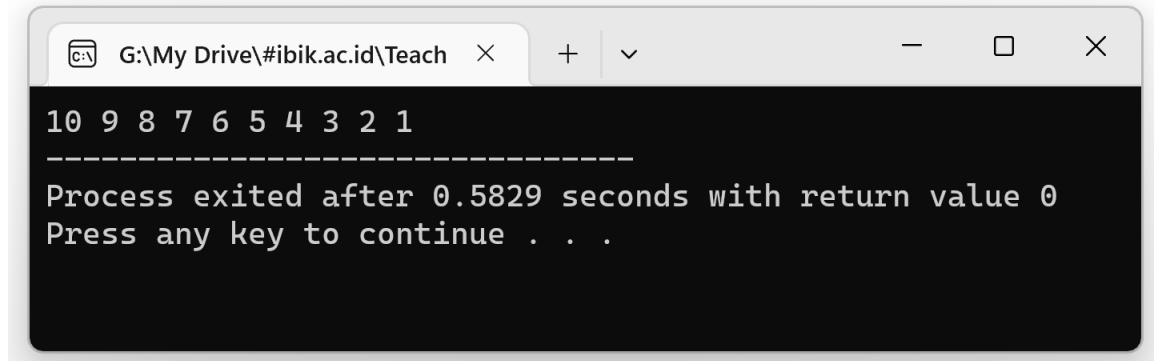
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          cout<< i << " ";
10     }
11 }
```



```
G:\My Drive\#ibik.ac.id\Teach × + ∨
1 2 3 4 5 6 7 8 9 10
-----
Process exited after 0.7185 seconds with return value 0
Press any key to continue . . .
```

Contoh 3 program *for*

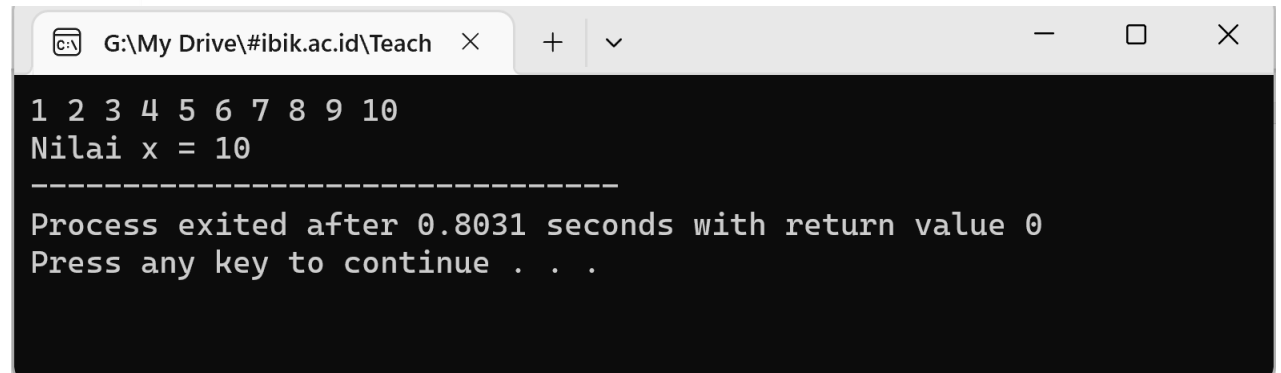
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=10; i>=1; i--) {
9          cout<< i << " ";
10     }
11 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
10 9 8 7 6 5 4 3 2 1
-----
Process exited after 0.5829 seconds with return value 0
Press any key to continue . . .
```

Contoh 4 program *for*

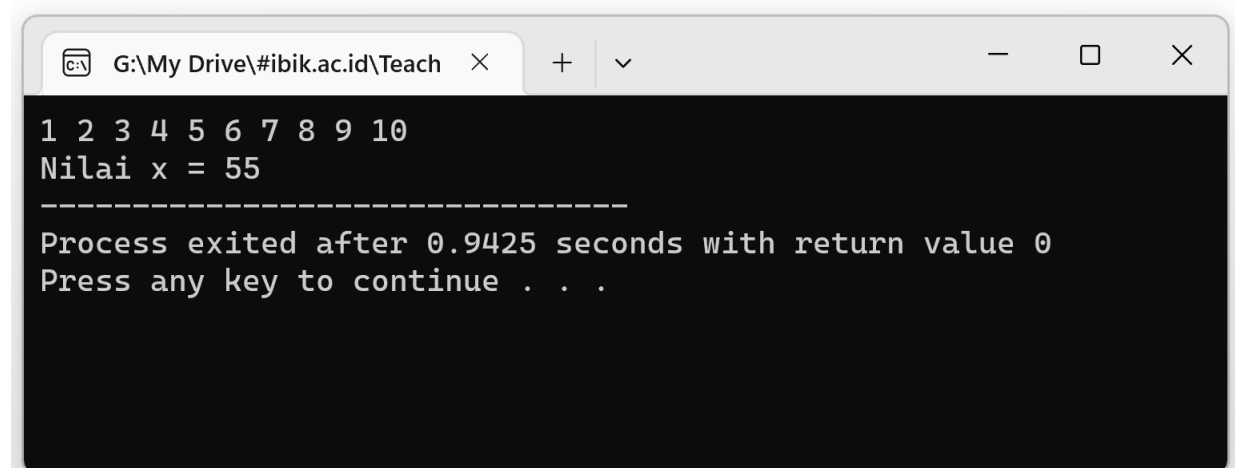
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, x=0;
7
8      for(i=1; i<=10; i++) {
9          cout<< i << " ";
10         x= i;
11     }
12
13     cout << endl << "Nilai x = " << x;
14 }
```



```
G:\My Drive\#ibik.ac.id\Teach × + ▾
1 2 3 4 5 6 7 8 9 10
Nilai x = 10
-----
Process exited after 0.8031 seconds with return value 0
Press any key to continue . . .
```

Contoh 5 program *for*

```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, x=0;
7
8      for(i=1; i<=10; i++) {
9          cout<< i << " ";
10         x += i;
11     }
12
13     cout << endl << "Nilai x = " << x;
14 }
```



```
G:\My Drive\#ibik.ac.id\Teach × + ∨ — □ ×
1 2 3 4 5 6 7 8 9 10
Nilai x = 55
-----
Process exited after 0.9425 seconds with return value 0
Press any key to continue . . .
```

Contoh 6 program *for*

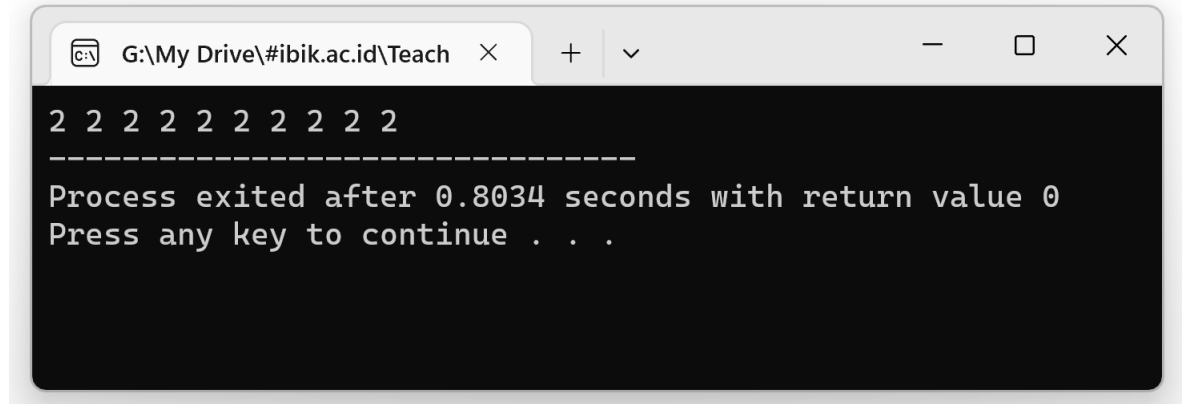
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          cout<< i << " " << i*i << endl;
10     }
11 }
```

G:\My Drive\#ibik.ac.id\Teach

1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100

Contoh 7 program *for*

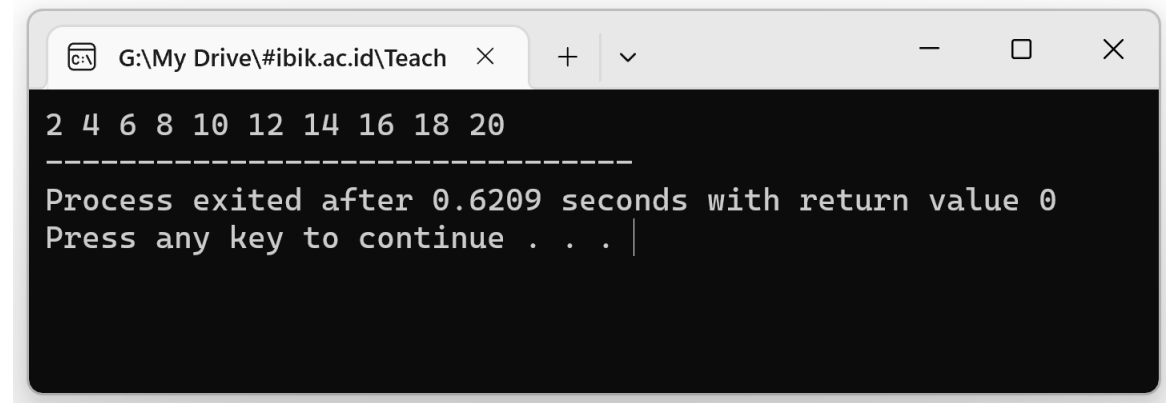
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, x;
7
8      x = 2;
9
10     for(i=1; i<=10; i++) {
11         cout<< x << " ";
12     }
13 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v
2 2 2 2 2 2 2 2 2 2
-----
Process exited after 0.8034 seconds with return value 0
Press any key to continue . . .
```

Contoh 7 program *for*

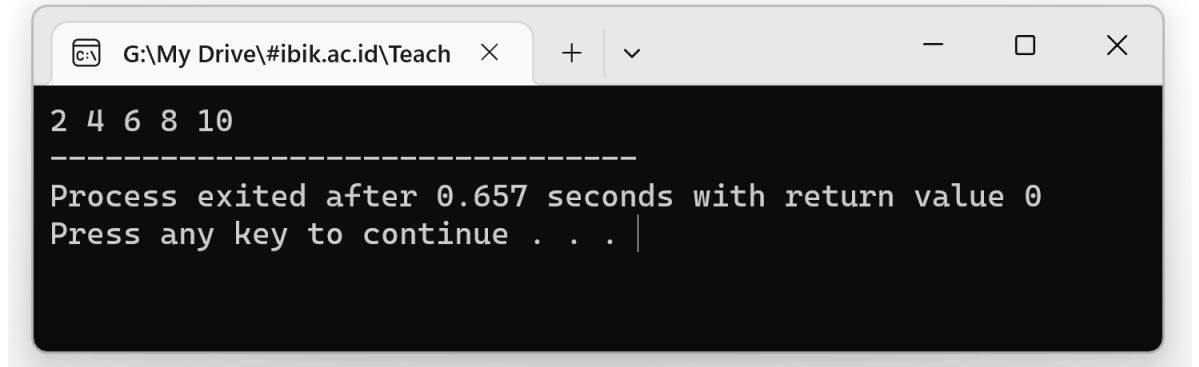
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, x;
7
8      x = 2;
9
10     for(i=1; i<=10; i++) {
11         cout<< x*i << " ";
12     }
13 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
2 4 6 8 10 12 14 16 18 20
-----
Process exited after 0.6209 seconds with return value 0
Press any key to continue . . .
```


Contoh 8 program *for*

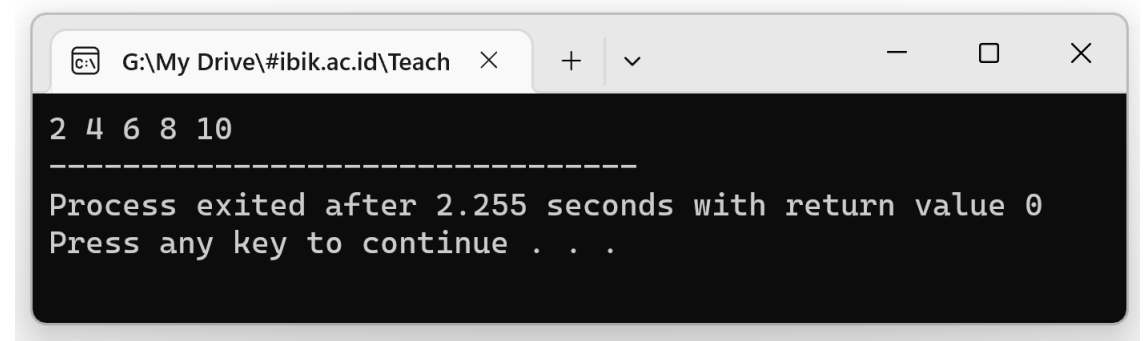
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          if (i%2==0) {
10             cout<< i << " ";
11         }
12     }
13 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
2 4 6 8 10
-----
Process exited after 0.657 seconds with return value 0
Press any key to continue . . .
```

Contoh 9 program *for*

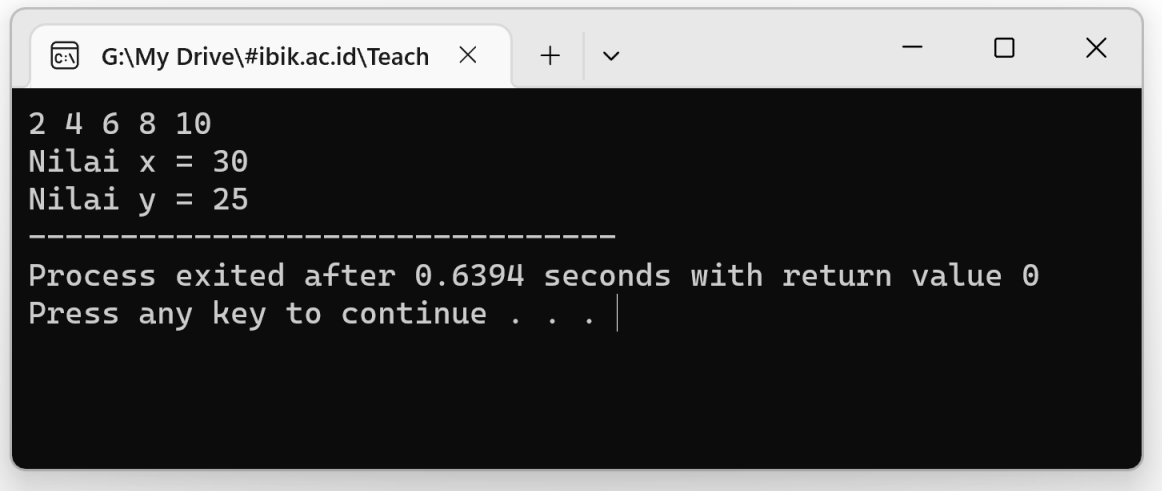
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          if (i%2!=1) {
10             cout<< i << " ";
11         }
12     }
13 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
2 4 6 8 10
-----
Process exited after 2.255 seconds with return value 0
Press any key to continue . . .
```

Contoh 10 program *for*

```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, x=0, y=0;
7
8      for(i=1; i<=10; i++) {
9          if (i%2==0) {
10             cout<< i << " ";
11             x = x+i;
12         }
13         else {
14             y += i;
15         }
16     }
17
18     cout << endl;
19     cout << "Nilai x = " << x << endl;
20     cout << "Nilai y = " << y;
21 }
```



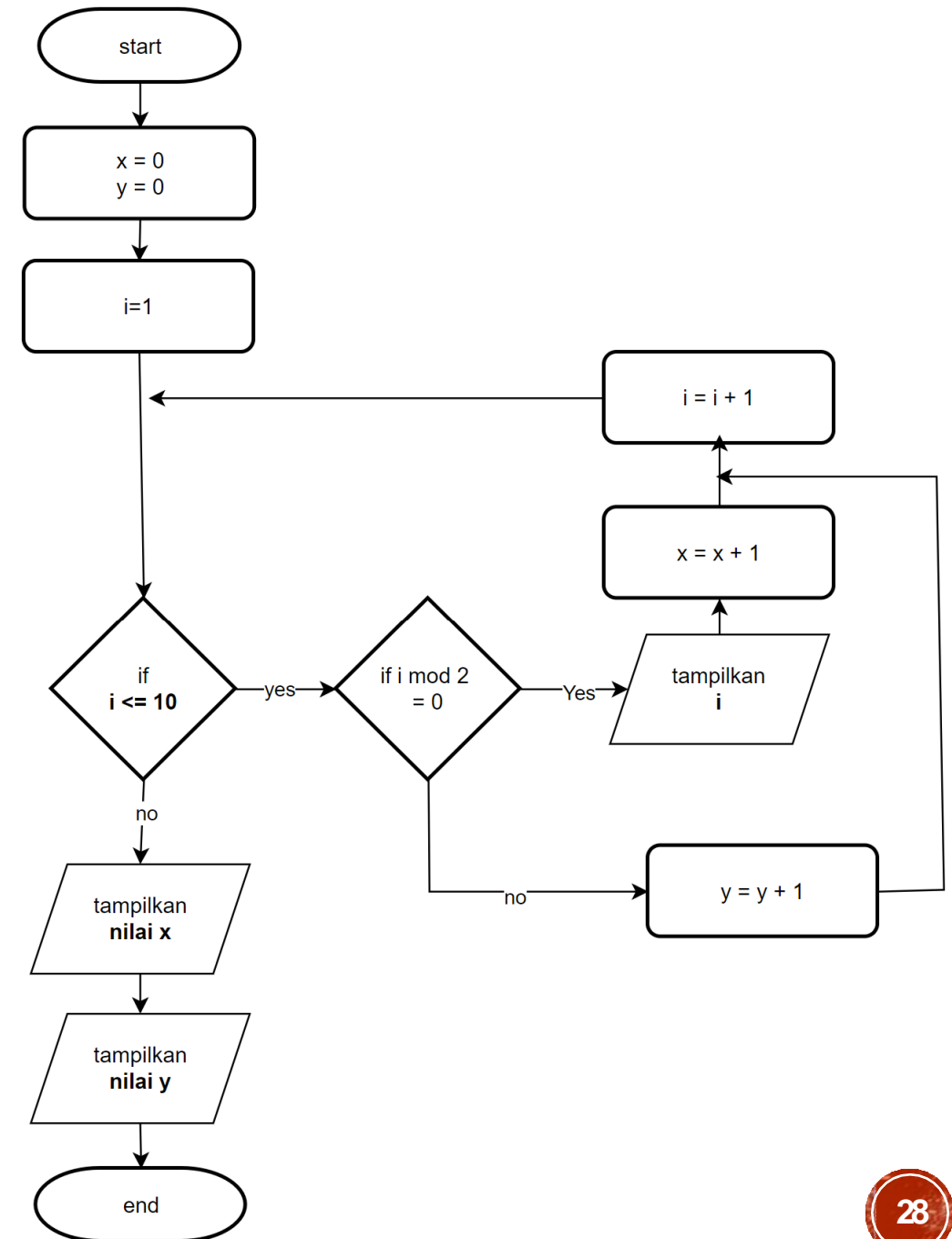
```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
2 4 6 8 10
Nilai x = 30
Nilai y = 25
-----
Process exited after 0.6394 seconds with return value 0
Press any key to continue . . . |
```

Flow chart contoh 10 program *for*

```

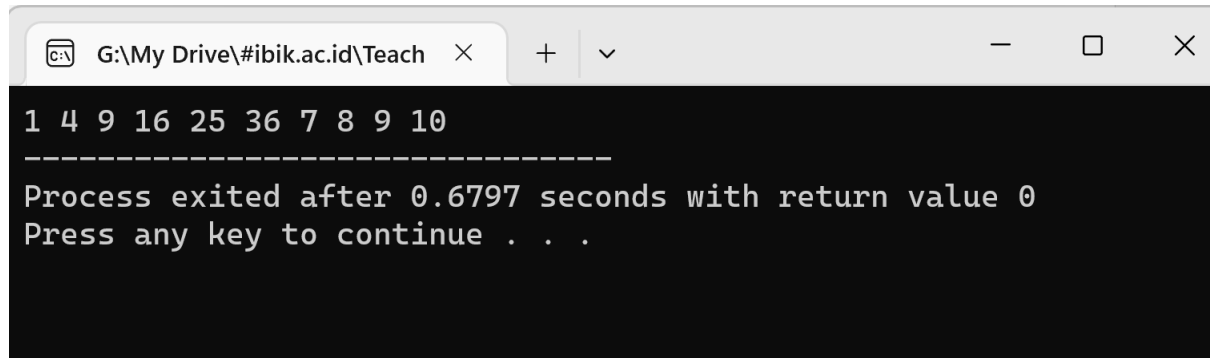
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, x=0, y=0;
7
8      for(i=1; i<=10; i++) {
9          if (i%2==0) {
10             cout<< i << " ";
11             x = x+i;
12         }
13         else {
14             y += i;
15         }
16     }
17
18     cout << endl;
19     cout << "Nilai x = " << x << endl;
20     cout << "Nilai y = " << y;
21 }

```



Contoh 11 program *for*

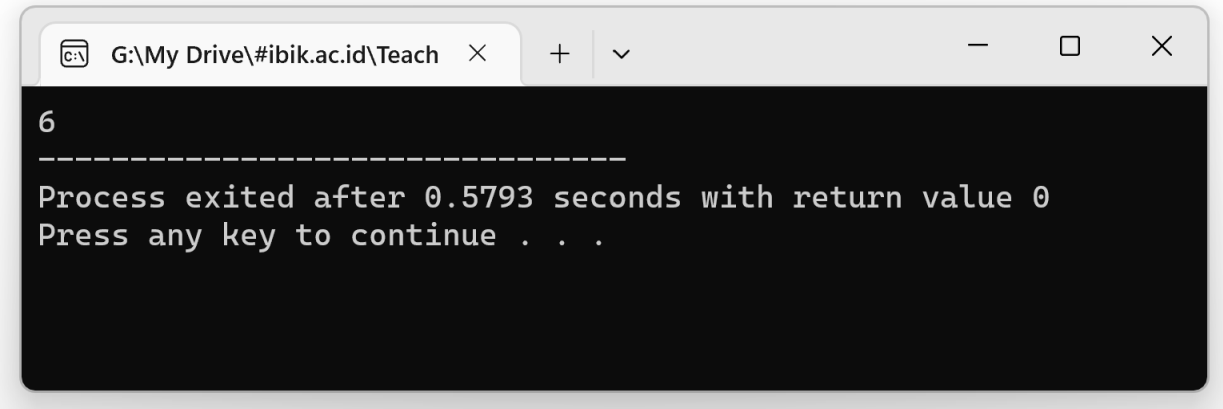
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          if(i*i<40) {
10             cout << i*i << " ";
11         }
12         else {
13             cout << i << " ";
14         }
15     }
16 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
1 4 9 16 25 36 7 8 9 10
-----
Process exited after 0.6797 seconds with return value 0
Press any key to continue . . .
```

Contoh 12 program *for*

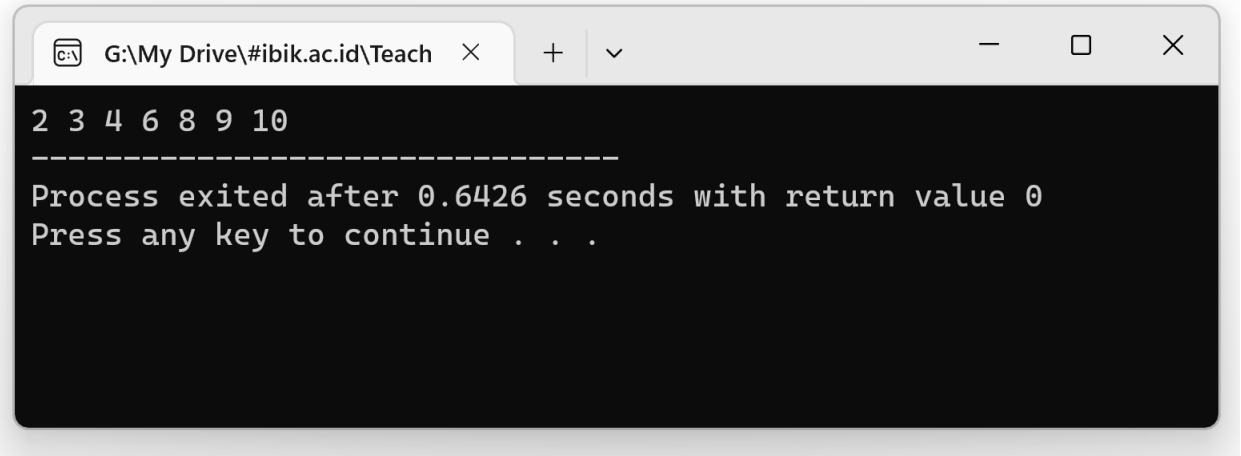
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          if (i%2==0 && i%3==0) {
10             cout<< i << " ";
11         }
12     }
13 }
```



```
G:\My Drive\#ibik.ac.id\Teach  X + v - □ X
6
-----
Process exited after 0.5793 seconds with return value 0
Press any key to continue . . .
```

Contoh 13 program *for*

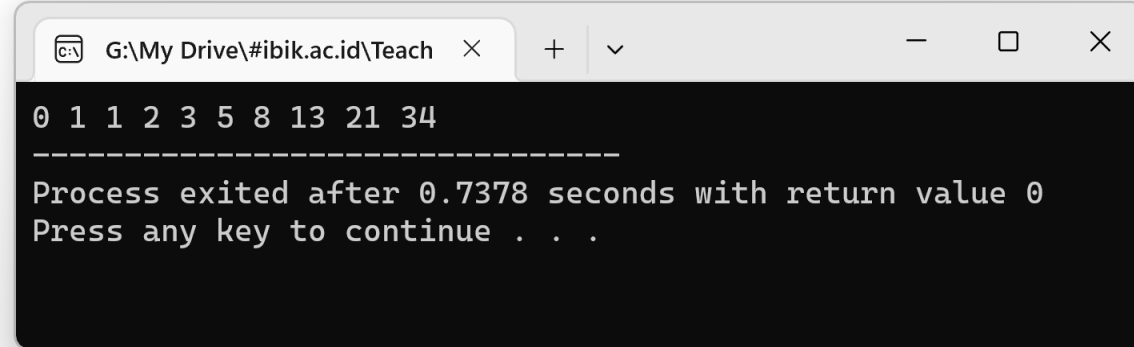
```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i;
7
8      for(i=1; i<=10; i++) {
9          if (i%2==0 || i%3==0) {
10             cout<< i << " ";
11         }
12     }
13 }
```



```
G:\My Drive\#ibik.ac.id\Teach × + ▾
2 3 4 6 8 9 10
-----
Process exited after 0.6426 seconds with return value 0
Press any key to continue . . .
```

Contoh 14 program *for*

```
1  #include<iostream>
2
3  using namespace std;
4
5  int main() {
6      int i, a=0, b=0, c=0;
7
8      for(i=1; i<=10; i++) {
9
10         cout << c << " ";
11
12         if (c!=0) {
13             c = a + b;
14         }
15         else {
16             c = 1;
17         }
18
19         a = b;
20         b = c;
21
22     }
23 }
```



```
G:\My Drive\#ibik.ac.id\Teach  × + v
0 1 1 2 3 5 8 13 21 34
-----
Process exited after 0.7378 seconds with return value 0
Press any key to continue . . .
```


END OF SLIDE



ALGORITMA & STRUKTUR DATA