

PERULANGAN

MACAM PERULANGAN

- Perulangan dengan while
- Perulangan dengan do-while
- Perulangan dengan for
- Perulangan *nested*

PERULANGAN

- Struktur kendali yang mengontrol berapa kali statement dieksekusi
- Efisiensi pengkodean
- Fundamental pemrograman
- Seperti if, perulangan dapat bersarang (*nested*)

Perulangan

- Banyaknya perulangan bergantung dari suatu kondisi dari perulangan tersebut. Perulangan dimaksudkan untuk meringkas penulisan kode program yang sama berulang kali secara berurutan.

Komponen dalam perulangan

1. Nilai awal

2. Batas Akhir

3. Perubahan nilai

Bentuk Umum While 1 tingkat

```
ungk1;  
while (ungk2)  
{  
    Statement;  
    unγκ3;  
}
```

Bentuk Umum Do-While 1 tingkat

```
ungk1;  
do  
{  
    Statement;  
    unγκ3;  
} while (ungk2) ;
```

Bentuk Umum For 1 tingkat


```
for (Ungk1 ; Ungk2 ; Ungk3 )  
{  
    Statement ;  
}
```


Keterangan

- Ungk1
 - Berisi deklarasi nilai awal
- Ungk2
 - Berisi pengecekan kondisi, Boolean,
 - Statemen secara berulang akan dieksekusi apabila kondisi_perulangan bernilai true, dan akan berhenti jika bernilai false
- Ungk3
 - Berisi perubahan nilai (Increment/Decrement)

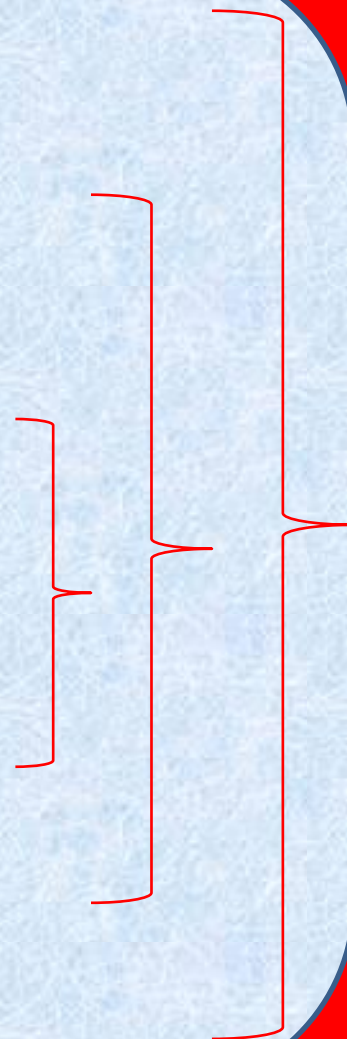
Bentuk Umum While 2 tingkat

```
ungk1;  
while (ungk2)  
{  
    unγκ1;  
    while (ungk2)  
    {  
        Statement;  
        unγκ3;  
    }  
    unγκ3;  
}
```

The diagram illustrates the structure of a two-level while loop. It uses curly braces to group the code into three main sections: the first level loop body, the second level loop body, and the final statement. A large brace on the right groups the first level loop body (ungk1; while (ungk2) { ... } unγκ3;). A medium brace on the right groups the second level loop body (while (ungk2) { Statement; unγκ3; }). A small brace on the right groups the final statement (ungk3;).

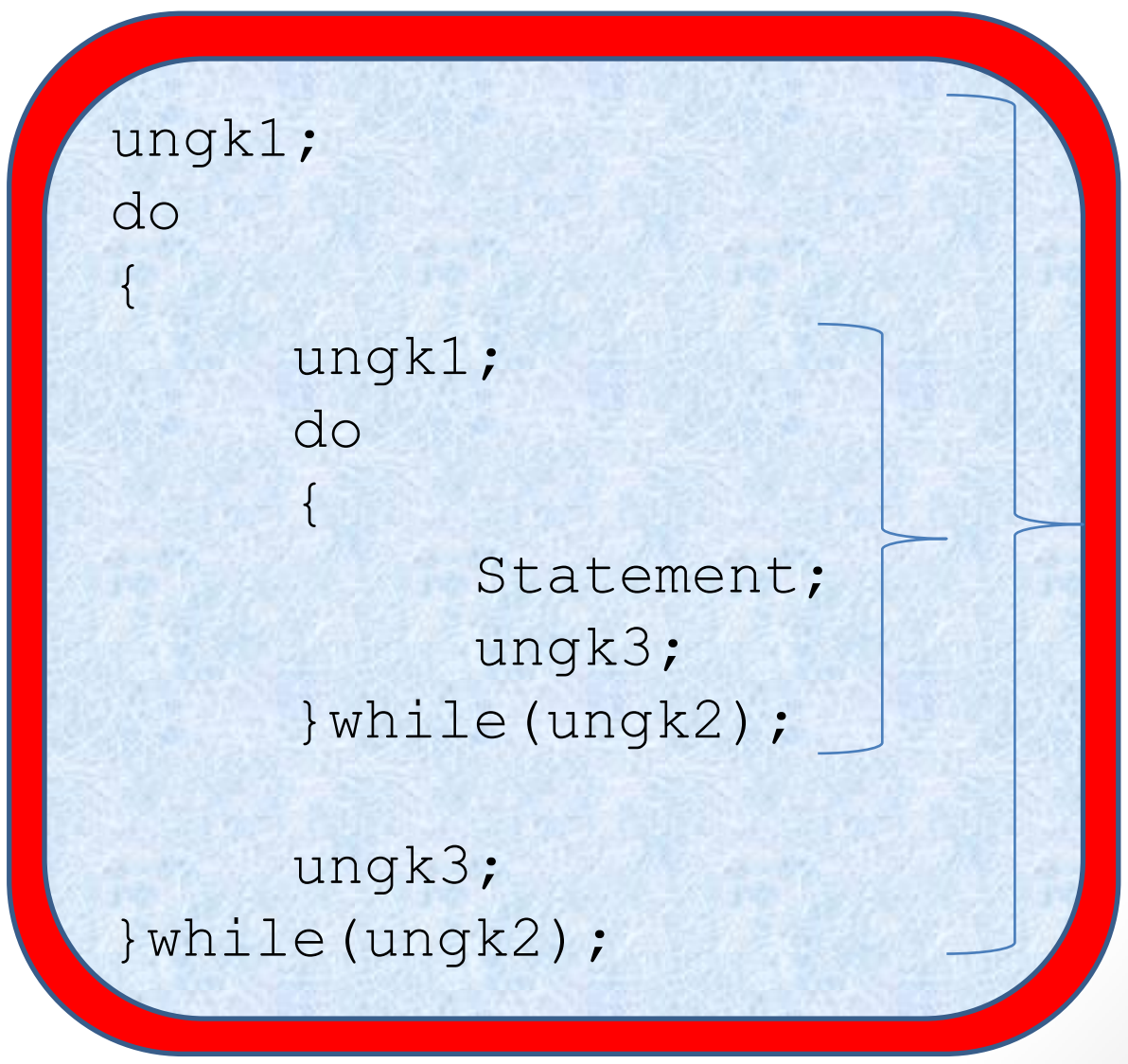
Bentuk Umum While 3 tingkat

```
ungk1;  
while (ungk2)  
{  
    unγκ1;  
    while (ungk2)  
    {  
        unγκ1;  
        while (ungk2)  
        {  
            Statement;  
            unγκ3;  
        }  
        unγκ3;  
    }  
    unγκ3;  
}
```



Bentuk Umum Do-While 2 tingkat

```
ungk1;  
do  
{  
    unγκ1;  
    do  
    {  
        Statement;  
        unγκ3;  
    } while (ungk2) ;  
    unγκ3;  
} while (ungk2) ;
```

The diagram illustrates the structure of a two-level do-while loop. It features a light blue rounded rectangle with a thick red border. Inside, the code is written in a monospaced font. Blue curly braces are used to group the code into three levels of nesting: the outermost loop (lines 1-10), the inner loop (lines 4-7), and the innermost loop body (lines 6-7). The braces are positioned to the right of the code, with the innermost brace at the line level, the middle brace at the block level, and the outermost brace at the loop level.

Bentuk Umum Do-While 3 tingkat

```
ungk1;  
do  
{
```

```
    unγκ1;  
    do  
    {
```

```
        unγκ1;  
        do  
        {
```

```
            Statement;  
            unγκ3;  
        }while (unγκ2);
```

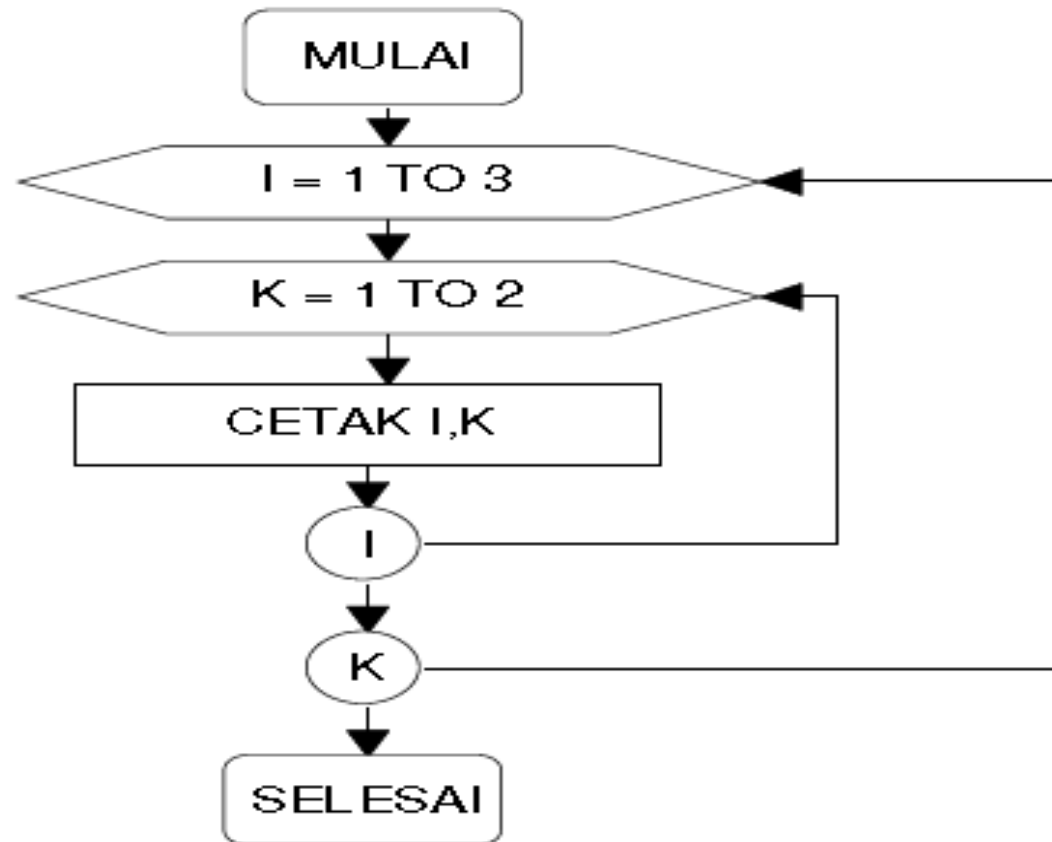
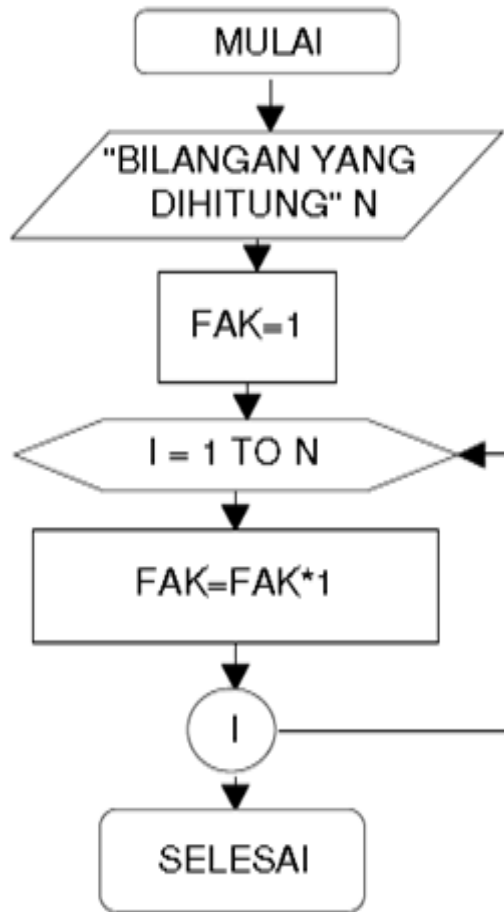
```
    unγκ3;  
}while (unγκ2);
```

```
    unγκ3;  
}while (unγκ2);
```

Nested for

- Dalam **For** dikenal juga sebuah **For** yang disebut **For nested** (bersarang) yang mana terdapat **For** didalam **For** yang lainnya. Hal tersebut bergantung pada permasalahan yang diselesaikan.

Flowchart



Bentuk Umum For 2 tingkat

```
for (Ungk1;Ungk2;Ungk3)
```

```
{
```

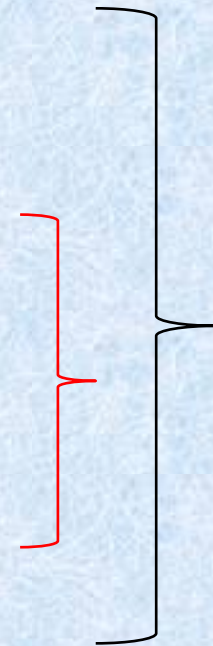
```
    for (Ungk1;Ungk2;Ungk3)
```

```
    {
```

```
        Statement;
```

```
    }
```

```
}
```



Bentuk Umum For 3 tingkat

```
for (Ungk1;Ungk2;Ungk3)
```

```
{
```

```
    for (Ungk1;Ungk2;Ungk3)
```

```
    {
```

```
        for (Ungk1;Ungk2;Ungk3)
```

```
        {
```

```
            Statement;
```

```
        }
```

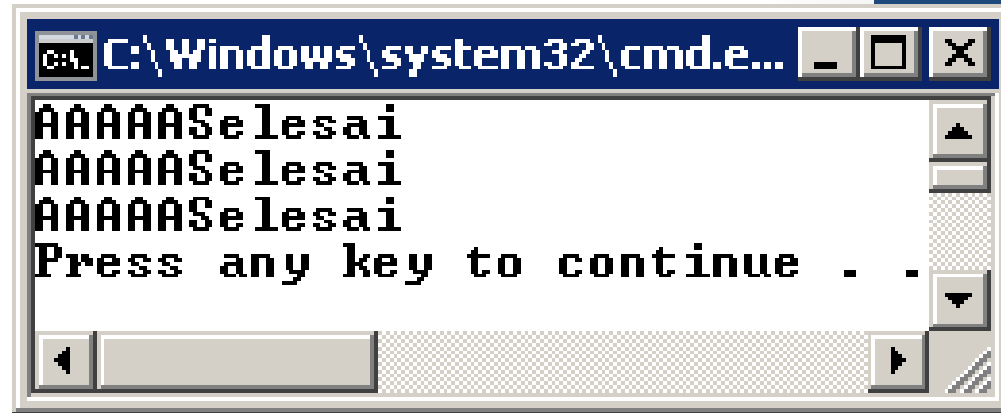
```
    }
```

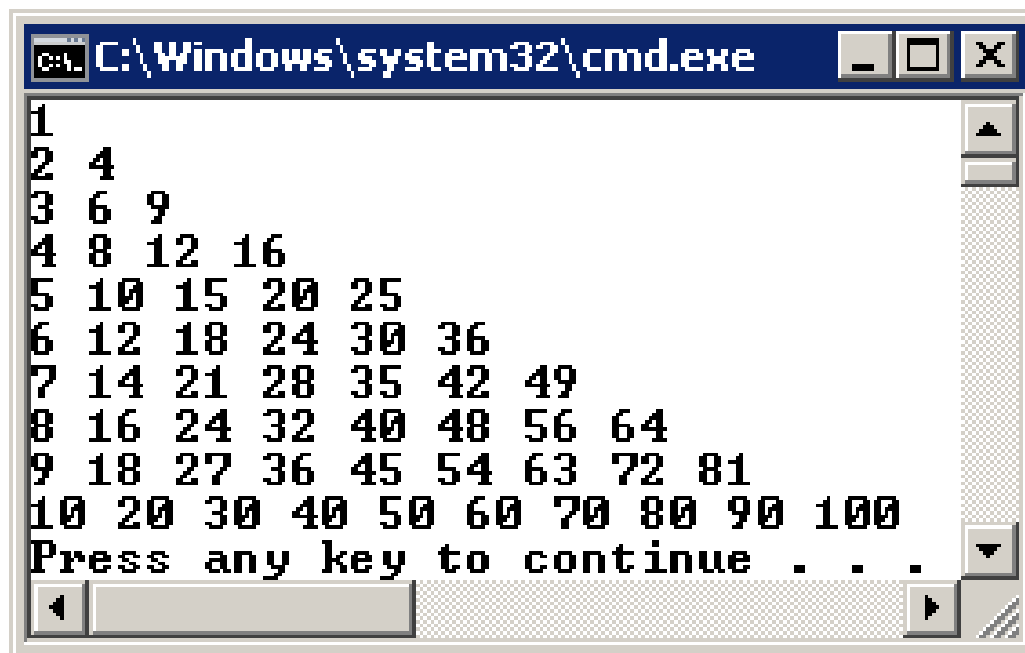
```
}
```



For 2 tingkat

```
public class for1{  
    public static void main(String arg[]) {  
        float i,j;  
        for(i=1;i<=3;i++)  
        {  
            for(j=1;j<=5;j++)  
            {  
                System.out.print("A");  
            }  
            System.out.println("Selesai");  
        }  
    }  
}
```

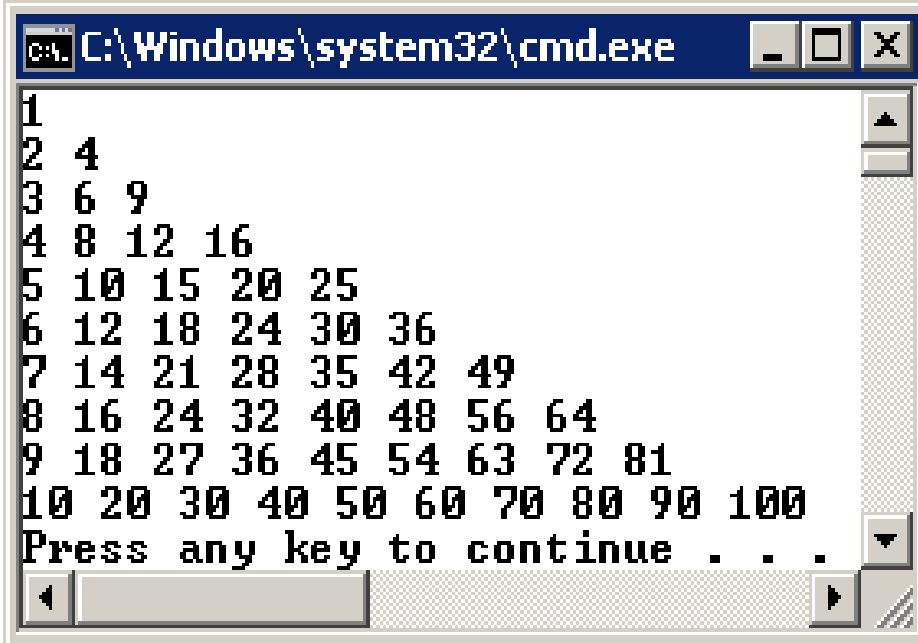




```
C:\Windows\system32\cmd.exe
1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
6 12 18 24 30 36
7 14 21 28 35 42 49
8 16 24 32 40 48 56 64
9 18 27 36 45 54 63 72 81
10 20 30 40 50 60 70 80 90 100
Press any key to continue . . .
```

For 2 tingkat

```
public class for2{  
    public static void main(String arg[]) {  
        int i,j;  
        for(i=1;i<=10;i++)  
        {  
            for(j=1;j<=i;j++)  
            {  
                System.out.print((j*i)+" ");  
            }  
            System.out.println("");  
        }  
    }  
}
```



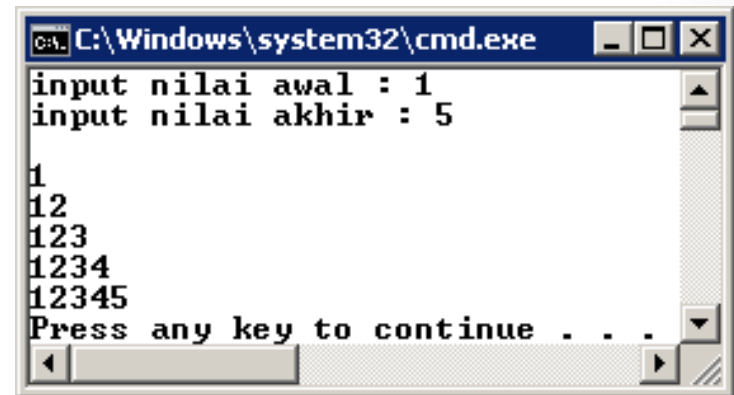
```
C:\Windows\system32\cmd.exe  
1  
2 4  
3 6 9  
4 8 12 16  
5 10 15 20 25  
6 12 18 24 30 36  
7 14 21 28 35 42 49  
8 16 24 32 40 48 56 64  
9 18 27 36 45 54 63 72 81  
10 20 30 40 50 60 70 80 90 100  
Press any key to continue . . .
```

OUTPUT

```
public class for2{  
    public static void main(String arg[]) {  
        int i,j;  
        for(i=1;i<=3;i++)  
        {  
            for(j=1;j<=i;j++)  
            {  
                System.out.print(j+" ");  
            }  
            System.out.println("");  
        }  
    }  
}
```

For 2 tingkat

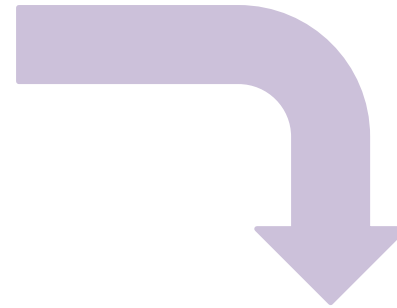
```
import java.util.Scanner;
public class for3{
public static void main(String arg[]) {
    Scanner in=new Scanner(System.in);
    int i,n,x,y;
    System.out.print("input nilai awal : ");
    x=in.nextInt();
    System.out.print("input nilai akhir : ");
    y=in.nextInt();
    for(i=0;i<=y;i++)
    {
        for(n=x;n<=i;n++)
        {
            System.out.print(n);
        }
        System.out.println(" ");
    }
}
```



```
C:\Windows\system32\cmd.exe
input nilai awal : 1
input nilai akhir : 5
1
12
123
1234
12345
Press any key to continue . . .
```

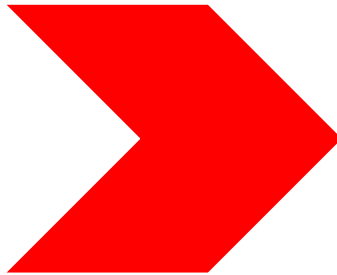
For 2 tingkat

```
public class for4{  
    public static void main(String arg[]) {  
        int b,k;  
        for(b=1;b<=3;b=b+1)  
        {  
            for(k=1;k<=5;k=k+1)  
            {  
                System.out.print(k+" ");  
                k=k+1;  
            }  
            System.out.println(" ");  
        }  
    }  
}
```

A screenshot of a Windows command prompt window. The title bar reads "C:\Windows\system32\cmd.exe". The window contains the following text:
1 3 5
1 3 5
1 3 5
Press any key to continue . . .
The text is displayed in a monospaced font. There are scrollbars on the right and bottom of the window.

For 2 tingkat

```
public class for5{
    public static void main(String arg[]) {
        int a,b;
        for(a=1;a<=4;a++) {
            for(b=1;b<=a;b++)
                System.out.print(b);
            System.out.println(" ");
        }
        System.out.println(" ");
        for(a=5;a>0;a--) {
            for(b=1;b<a;b++)
                System.out.print(b);
            System.out.println(" ");
        }
    }
}
```

A screenshot of a Windows command prompt window titled "C:\Windows\system32\cmd.exe". The window displays the output of the Java program, which consists of two parts: a forward triangle of numbers (1, 12, 123, 1234) followed by a blank line, and then a reverse triangle of numbers (1234, 123, 12, 1) followed by a blank line. At the bottom, it says "Press any key to continue . . .".

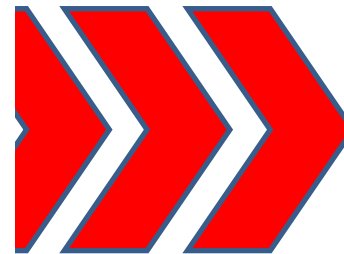
```
C:\Windows\system32\cmd.exe
1
12
123
1234

1234
123
12
1

Press any key to continue . . .
```


For 3 tingkat

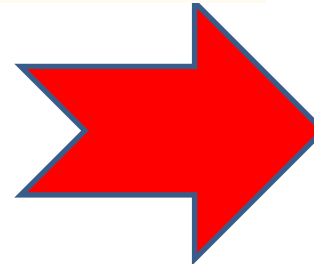
```
public class for6{  
public static void main(String arg[]) {  
    int thn,item;  
    char toko;  
    int a=10;  
    for(thn=1;thn<3;thn++)  
    {  
        System.out.println("Tahun-"+thn);  
        for(toko='A';toko<='C';toko++)  
        {  
            System.out.println("Toko-"+toko);  
            for(item=1;item<=2;item++)  
            {  
                System.out.println(a);  
                a++;  
            }  
        }  
    }  
}
```



```
C:\Windows\sys...  
Tahun-1  
Toko-A  
10  
11  
Toko-B  
12  
13  
Toko-C  
14  
15  
Tahun-2  
Toko-A  
16  
17  
Toko-B  
18  
19  
Toko-C  
20  
21  
Press any key to conti
```

For 3 tingkat

```
public class for7{  
public static void main(String arg[]) {  
    int i,j,k;  
    for(i=0;i<3;i++)  
    {  
        System.out.println("hai ");  
        for(j=0;j<2;j++)  
        {  
            System.out.println("hello ");  
            for(k=0;k<2;k++)  
            {  
                System.out.println("STMIK AKAKOM");  
            }  
        }  
    }  
}
```



```
C:\Windows\sy...  
hai  
hello  
STMIK AKAKOM  
STMIK AKAKOM  
hello  
STMIK AKAKOM  
STMIK AKAKOM  
hai  
hello  
STMIK AKAKOM  
STMIK AKAKOM  
hello  
STMIK AKAKOM  
STMIK AKAKOM  
hai  
hello  
STMIK AKAKOM  
STMIK AKAKOM  
hello  
STMIK AKAKOM  
STMIK AKAKOM  
Press any key to co
```

For 3 tingkat

```
public class for8{  
public static void main(String arg[]) {  
    int a,b,c;  
    for(a=1;a<=4;a++)  
    {  
        for(b=1;b<=a;b++)  
        {  
            for(c=1;c<=b;c++)  
            {  
                System.out.print(" * ");  
            }  
            System.out.println(" ");  
        }  
        System.out.println(" ");  
    }  
}  
}
```



