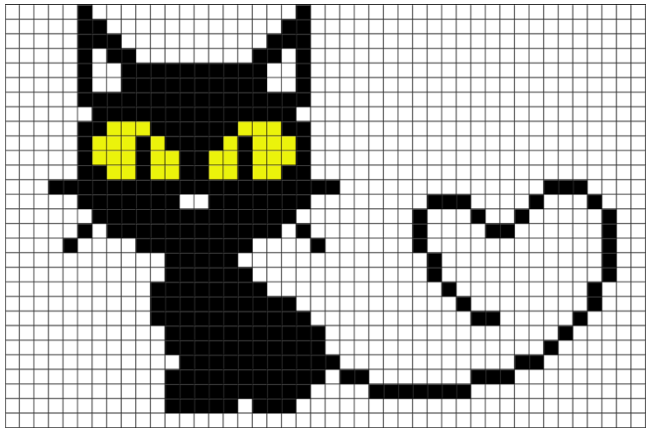
Diziler ve Matrisler



Suhap SAHIN
Onur GÖK

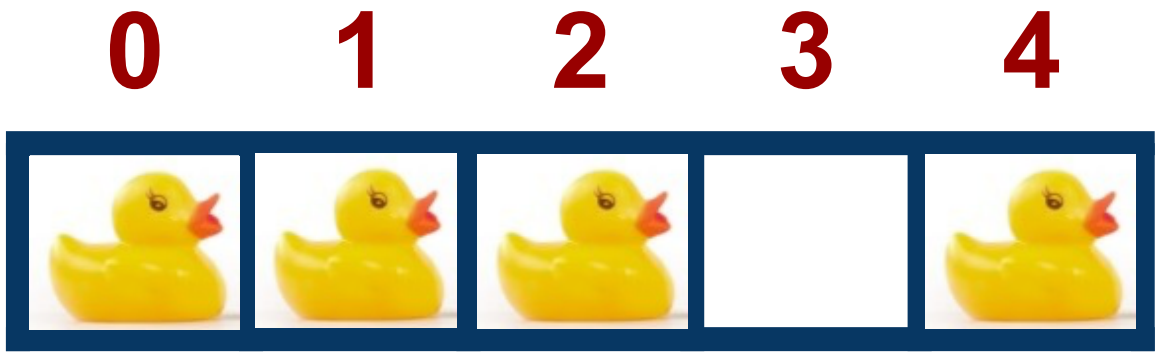
Dizi Tanımı

0 1 2 3 4

Dizi Tanımı

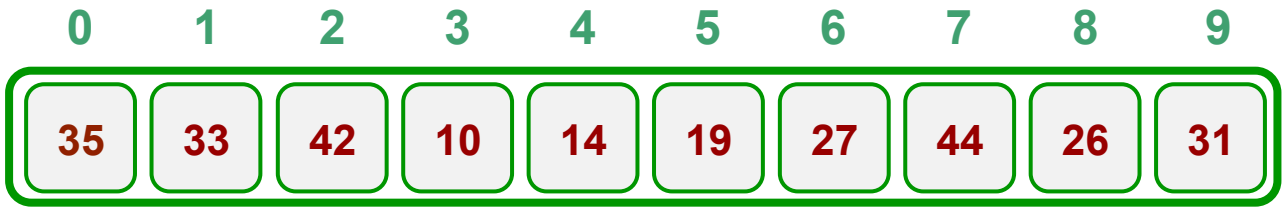
0 1 2 3 4

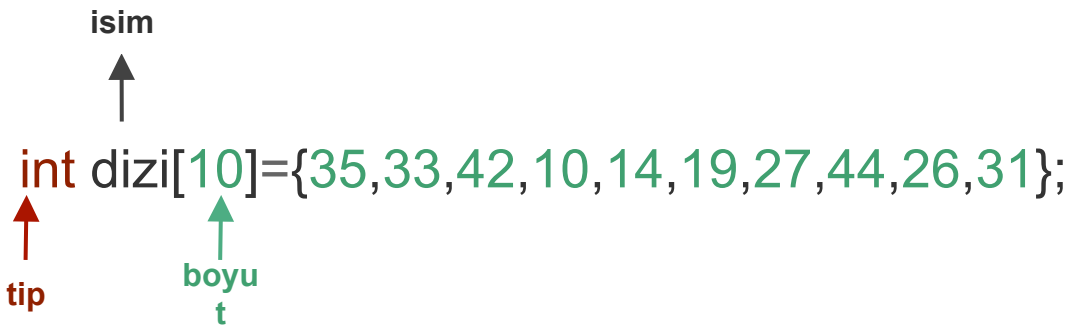
Dizi Tanımı



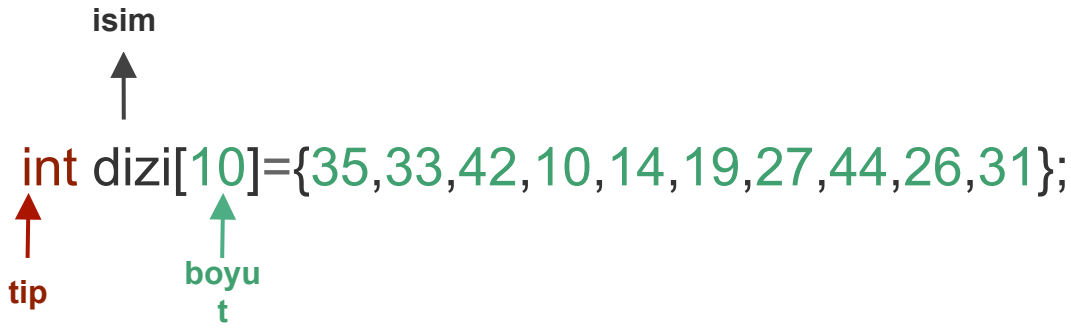
Dizi Tanımı

Dizi Gösterimi





Dizi Gösterimi



index: 0’dan baslar

Dizinin Boyutu: Sakladıgı eleman kadardır

Erisim: Dizile elemanına erisim için index numarası kullanılır

Bellek yerlesimi

isim

```
int dizi[10]={35,33,42,10,14,19,27,44,26,31};
```

tip

boyut

35	33	42	10	14	19	27	44	26	31

Adres	Bellek icerigi
...	...
0F1C	
0F20	35
0F24	33
0F28	42
0F2C	10
0F30	14
0F34	19
0F38	27
0F3C	44
0F40	26
0F44	31
...	...

Bellek yerlesimi

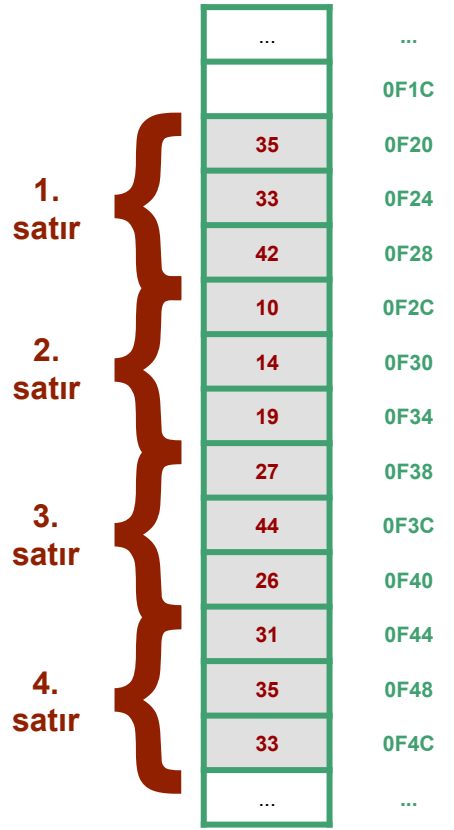
isim

```
int matris[4][3]={35,33,42,10,14,19,27,44,26,31,35,33};
```

tip

boyut

1. satır	35	33	42
2. satır	10	14	19
3. satır	27	44	26
4. satır	31	35	33



Dizi Boyutları

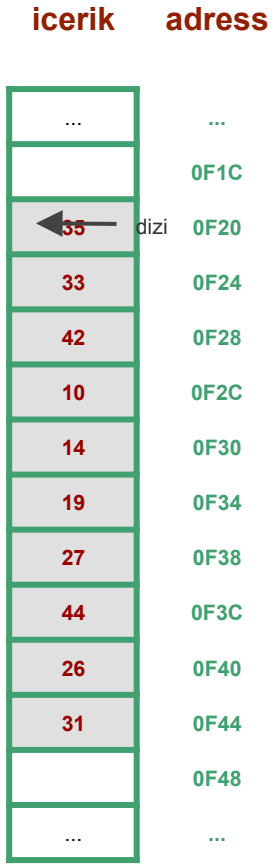
isim

```
int dizi[10]={35,33,42,10,14,19,27,44,26,31};
```

tip

boyut

```
dizi[2] = 42
*(dizi+2) = ?
int *dizi = malloc(10*sizeof(int));
```



Matris Boyutları

isim

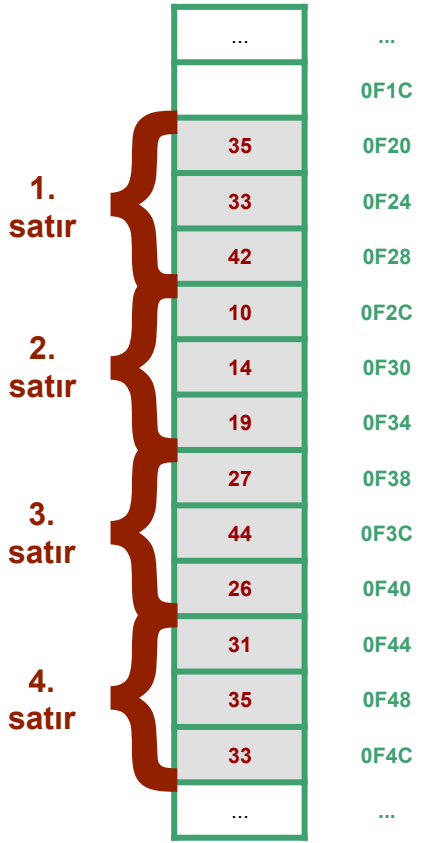
```
int dizi[4][3]={35,33,42,10,14,19,27,44,26,31,35,33};
```

tip

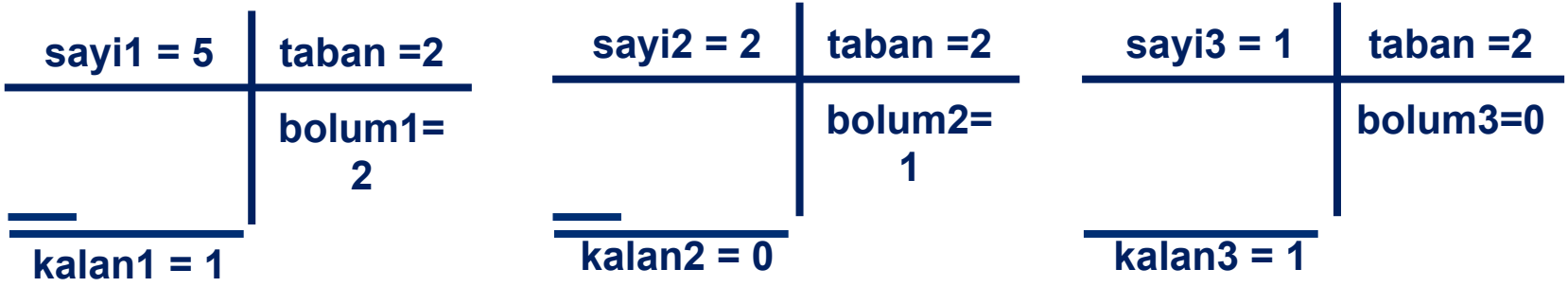
boyut

```
int *matris = malloc(N*M*sizeof(int))
int matris[M][N]
matris[1][2]
matris[1*N+2]
matris[5]
```

1. satır	35	33	42
2. satır	10	14	19
3. satır	27	44	26
4. satır	31	35	33



Örnek: Taban çevrimi

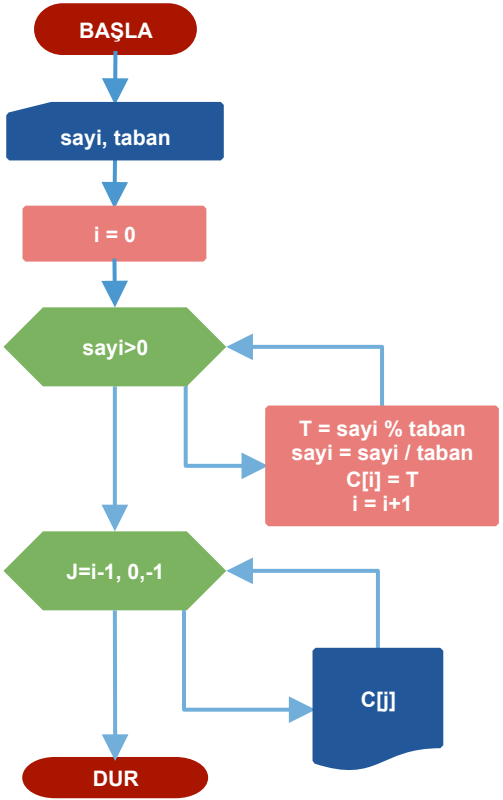



```
kalan1 = sayi1 % taban
```

```
sayi2 = sayi1 / taban
kalan2 = sayi2 % bolen
```

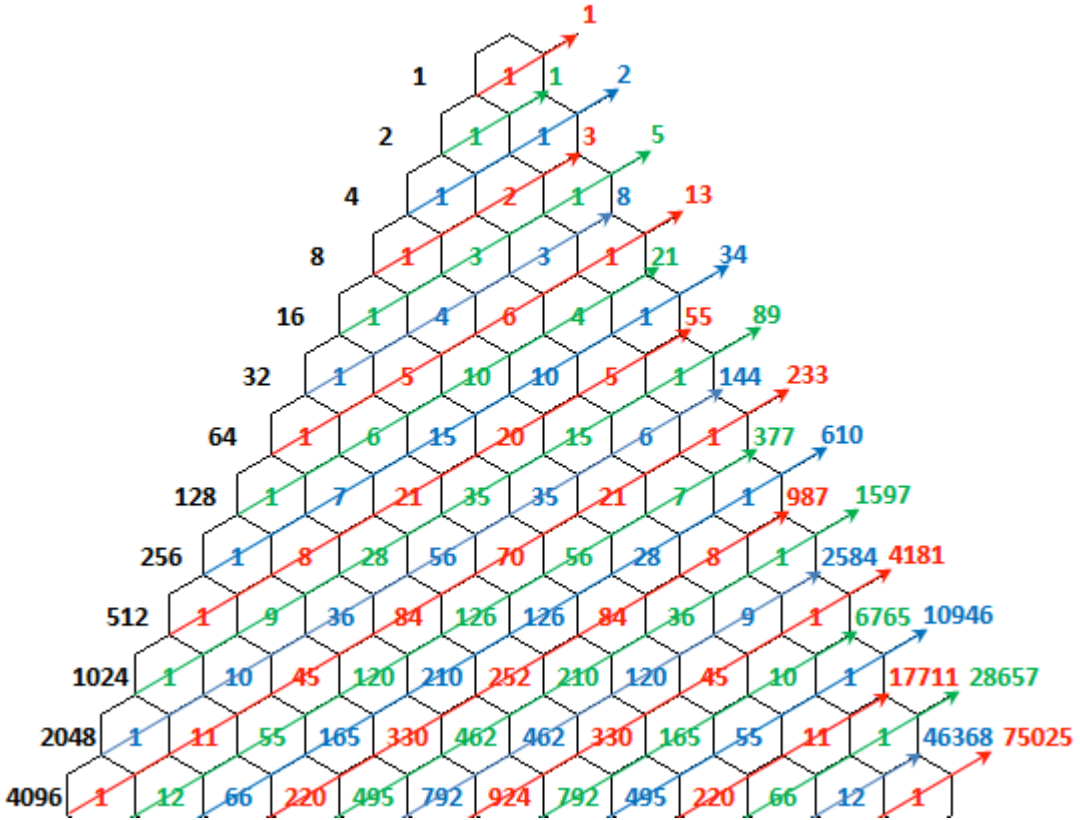
```
sayi3 = sayi2 / taban
kalan3 = sayi3 % bolen
```

Örnek: Taban çevrimi

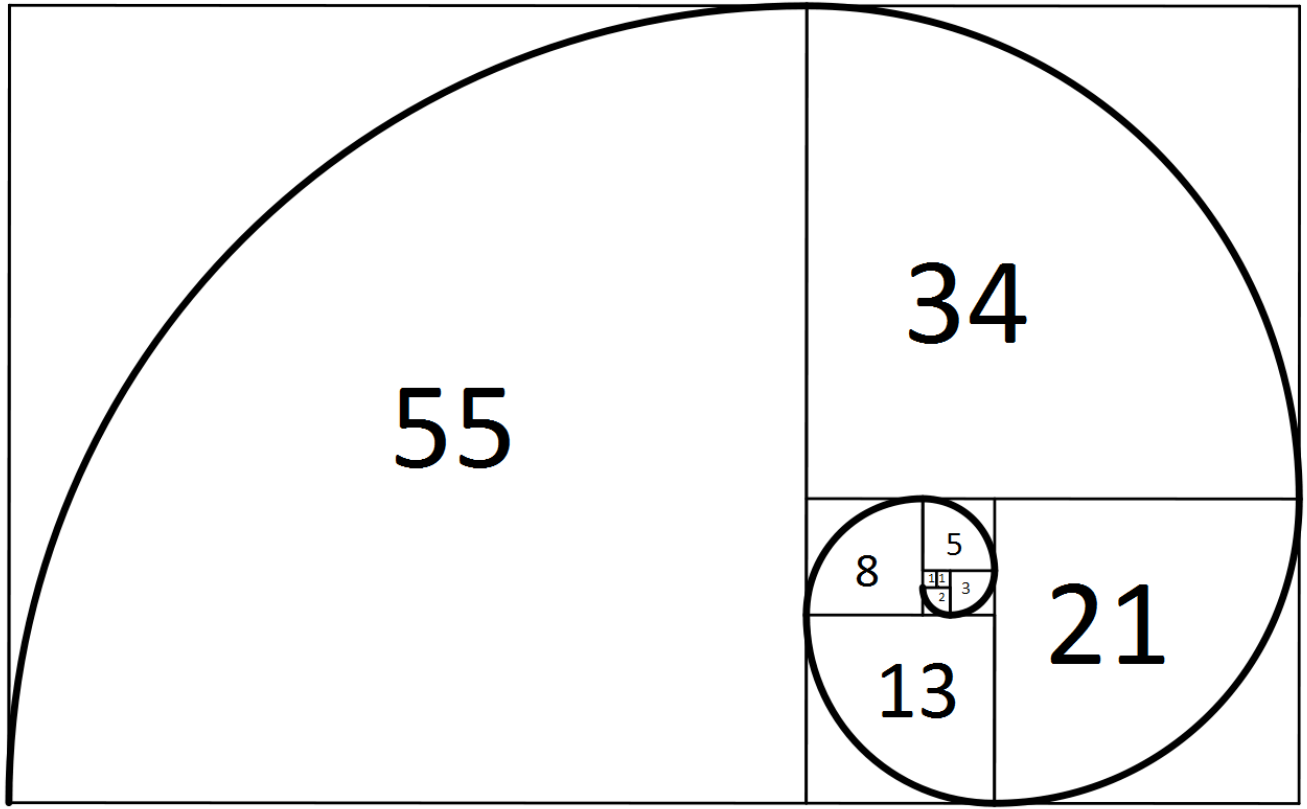



```c
#include <stdio.h>
void main()
{
    int sayi, taban, T;
    sayi = 5;
    taban = 2;
    int C[3];
    int i =0;
    while(sayi>0){
        T = sayi % taban;
        sayi = sayi / taban;
        C[i] = T;
        i = i+1;
    }
    for(i=2;i >-1;i--){
        printf("%d",C[i]);
    }
}
```

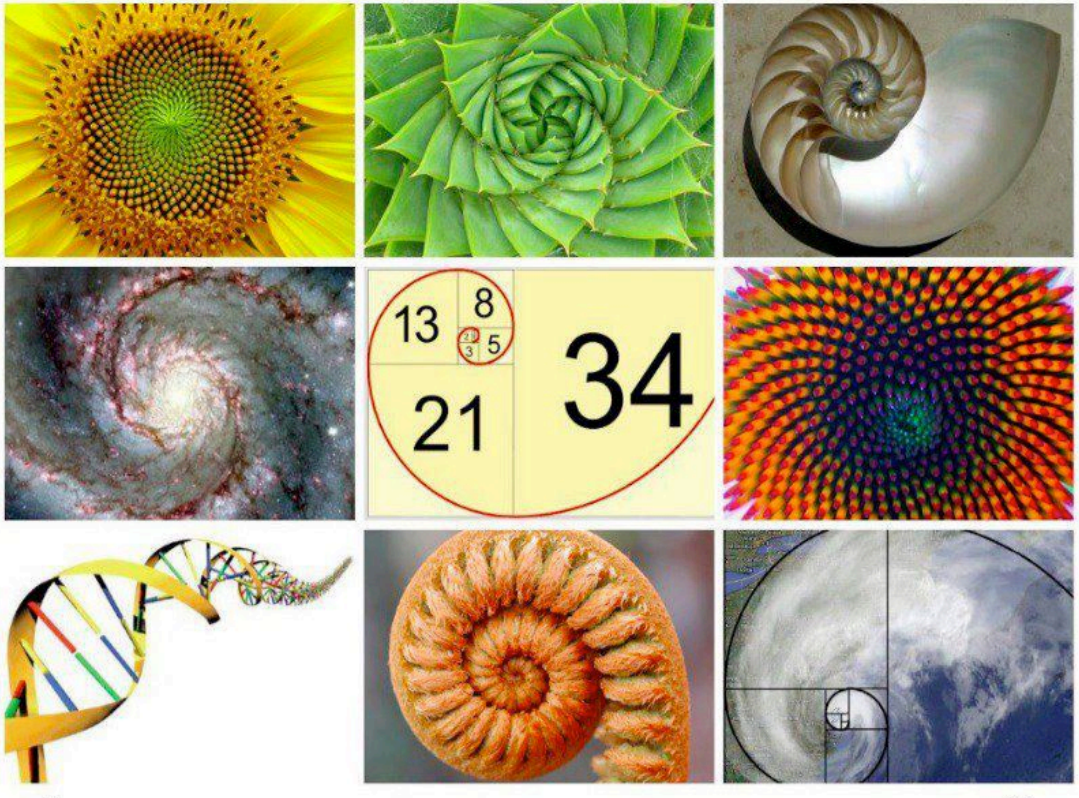
Örnek: Fibonacci Sayıları



Örnek: Fibonacci Sayıları



Örnek: Fibonacci Sayıları



Örnek: Fibonacci Sayıları

```
int A[10]={0,1,1,2,3,5,8,13,21,34};
```

0

1

0+1=1

1+1=2

1+2=3

2+3=5

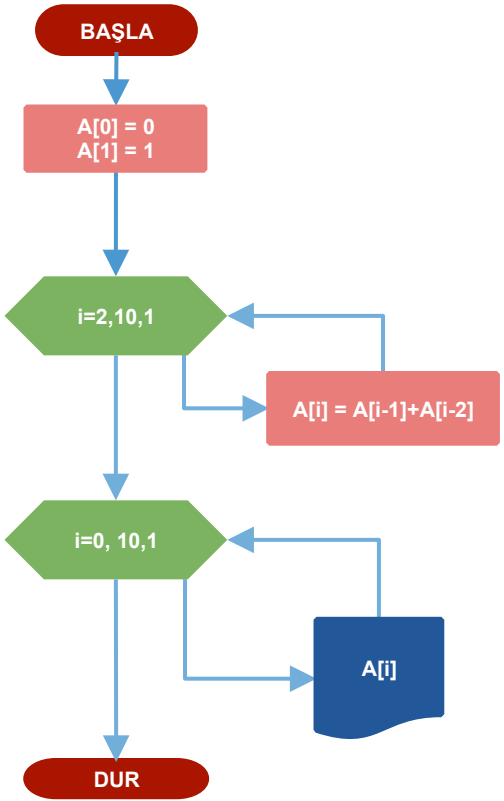
3+5=8

5+8=13

8+13=21

13+21=34

Örnek: ilk 10 fibonacci sayıları




```c
#include <stdio.h>
void main()
{
    int A[10];
    A[0]=0;
    A[1]=1;
    int i;
    for(i=2;i<10;i++){
        A[i] = A[i-1]+A[i-2];
    }
    for(i=0;i <10;i++){
        printf("%d,",A[i]);
    }
}
```

Örnek: Diziyi tersini al

Örnek: Diziyi tersten yazdır

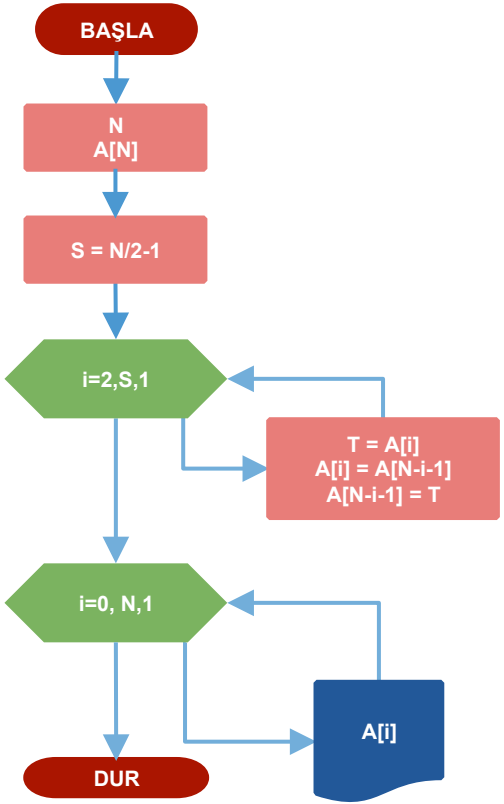
```
int A[4]={1,3,2,4};
```

```
int A[4]={1,3,2,4};
```

```
int A[4]={4,3,2,1};
```

```
int A[4]={4,2,3,1};
```

Örnek: Diziyi tersten yazdır



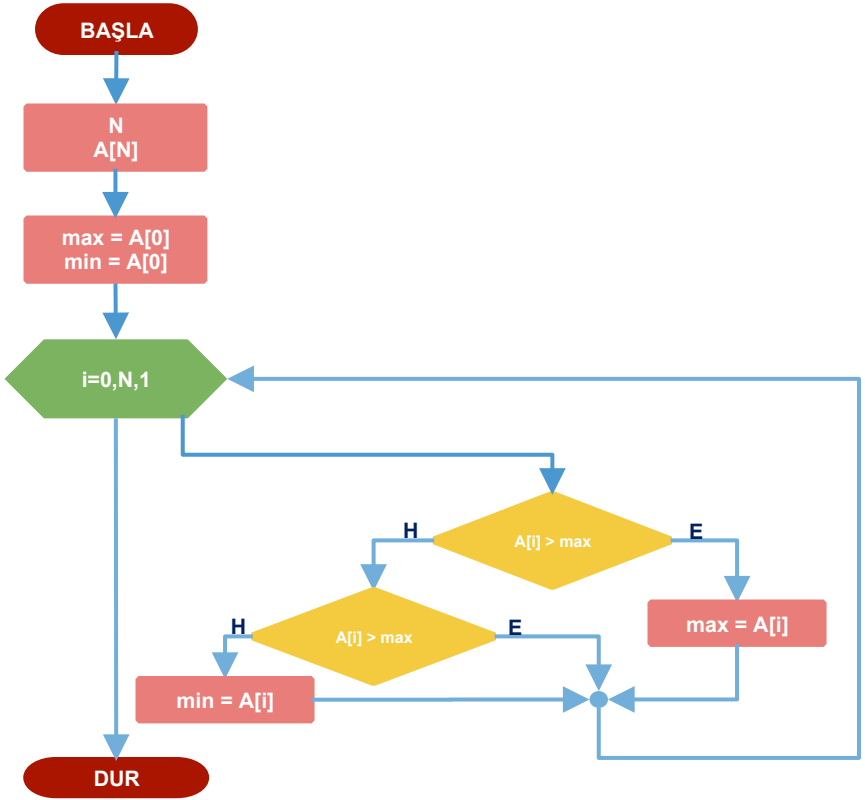

```c
#include <stdio.h>
void main()
{
    int N,S,T;
    N=4;
    int A[]={1,3,2,4};
    S=N/2-1;
    int i;
    for(i=0;i<S;i++){
        T=A[i];
        A[i]=A[N-i-1];
        A[N-i-1]=T;
    }
    for(i=0;i <N;i++){
        printf("%d,",A[i]);
    }
}
```

Örnek: En küçük ve en

Örnek: En küçük ve en büyük

```
int A[4]={1,3,2,4};

        min = A[0]; min = 1
        max = A[0];max = 1

        min > A[1];min = 1
        max < A[1];max = 3
```

Örnek: En küçük ve en büyük




```c
#include <stdio.h>
void main()
{
    int N,max,min;
    N=4;
    int A[]={1,3,2,4};
    min = A[0];
    max = A[0];
    int i;
    for(i=0;i<N;i++){
        if(A[i]>max){
            max = A[i];
        }else if(A[i]<min){
            min = A[i];
        }
    }
    printf("%d %d",min, max);
}
```

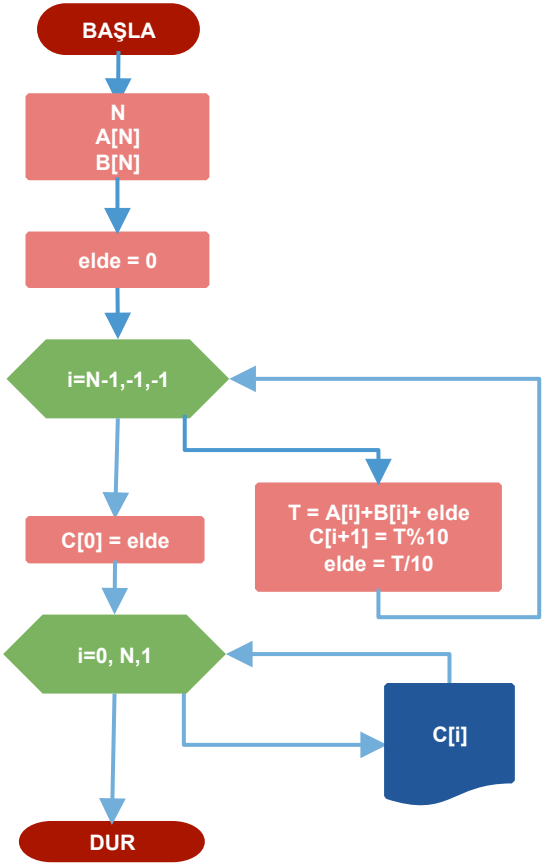
Örnek: Dizi1 + Dizi2

```
    int A[5] = {1,2,3,4,5};
+   int B[5] = {9,0,0,3,7};
-------------------------
  int C[6] = {1,0,2,3,8,2};
```

```
elde =1;      A[4] =5;
            + B[4] =7;
              ------
              C[5] =2;
```

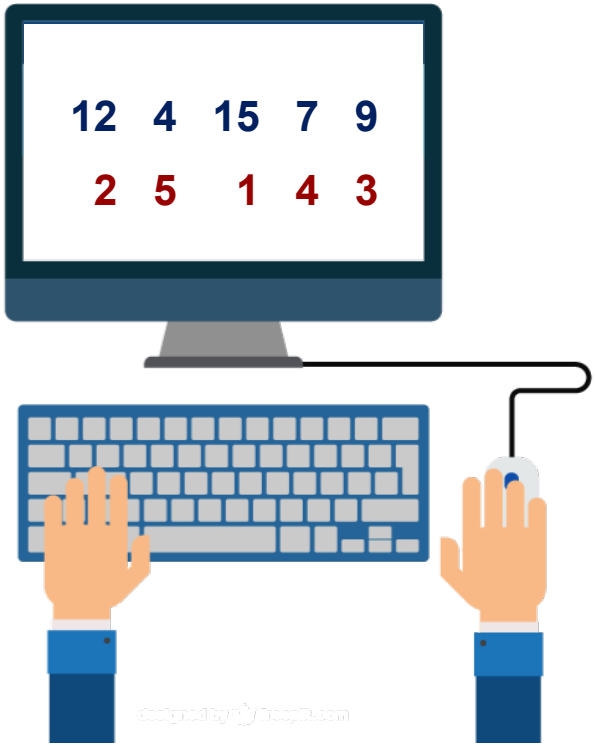
```
C[i+1] = (A[i] + B[i] +elde) %10;
elde = (A[i] + B[i] +elde)/10;
```

Örnek: Dizi1 + Dizi2




```c
#include <stdio.h>
void main()
{
    int N,T,elde;
    N=5;
    int A[]={1,2,3,4,5};
    int B[]={9,0,0,3,7};
    int C[6];
    elde = 0;
    int i;
    for(i=N-1;i>-1;i--){
        T = A[i] + B[i] +elde;
        C[i+1] = T %10;
        elde = T/10;
    }
    C[0]=elde;
    for(i=0;i<N+1;i++){
        printf("%d",C[i]);
    }
}
```

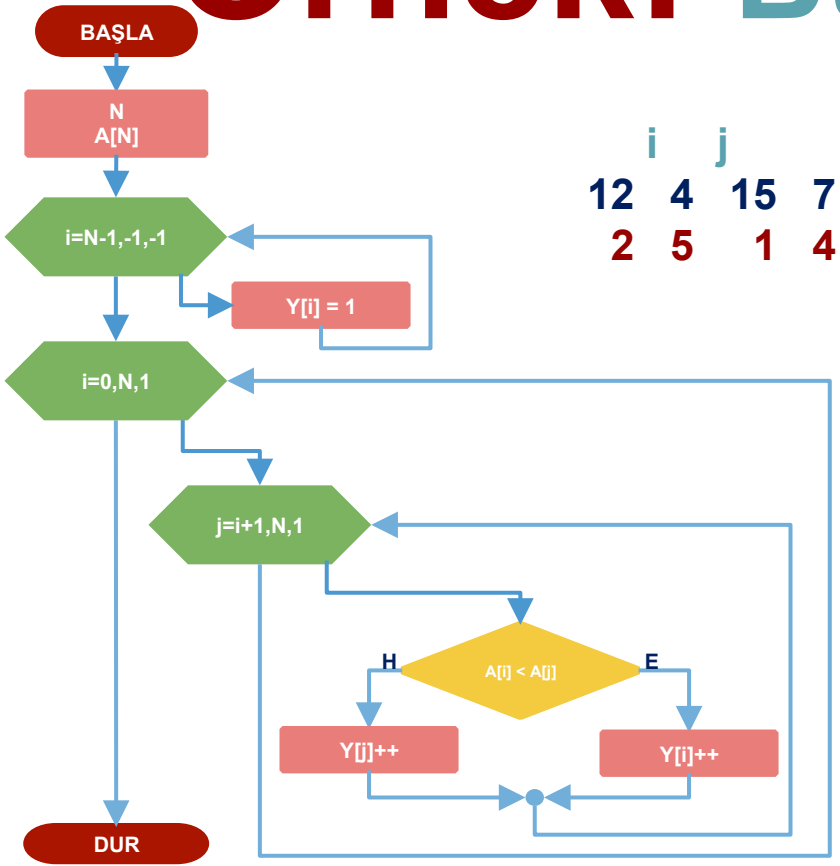
Örnek: Büyüklük sırası



Örnek: Büyüklük sırası

```
int A[5]={12,4,15,7,9};        int Y[5]={1,1,1,1,1};

      i  j
int A[4]={12,4,15,7,9};        int Y[5]={1,2,1,1,1};

      i     j
int A[4]={12,4,15,7,9};        int Y[5]={2,2,1,1,1};

      i        j
int A[4]={12,4,15,7,9};        int Y[5]={2,2,1,2,1};

      i           j
int A[4]={12,4,15,7,9};        int Y[5]={2,2,1,2,2};
```

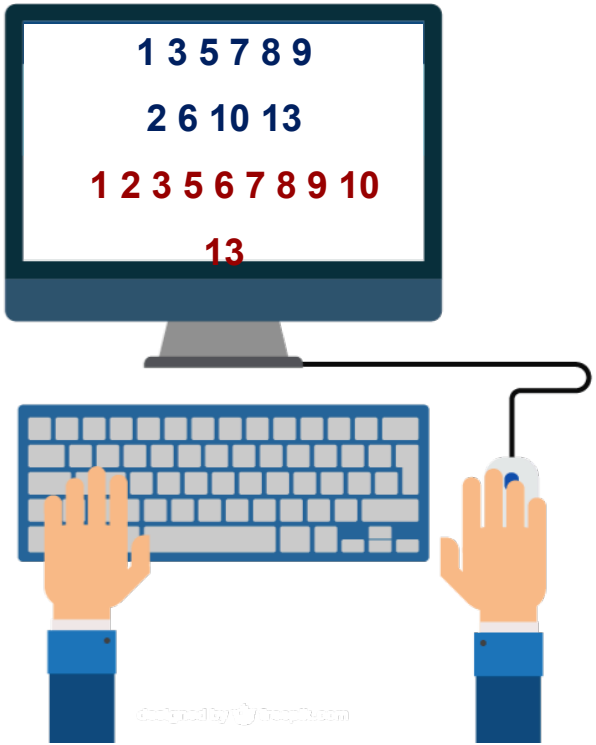
Örnek: Büyüklük sırası



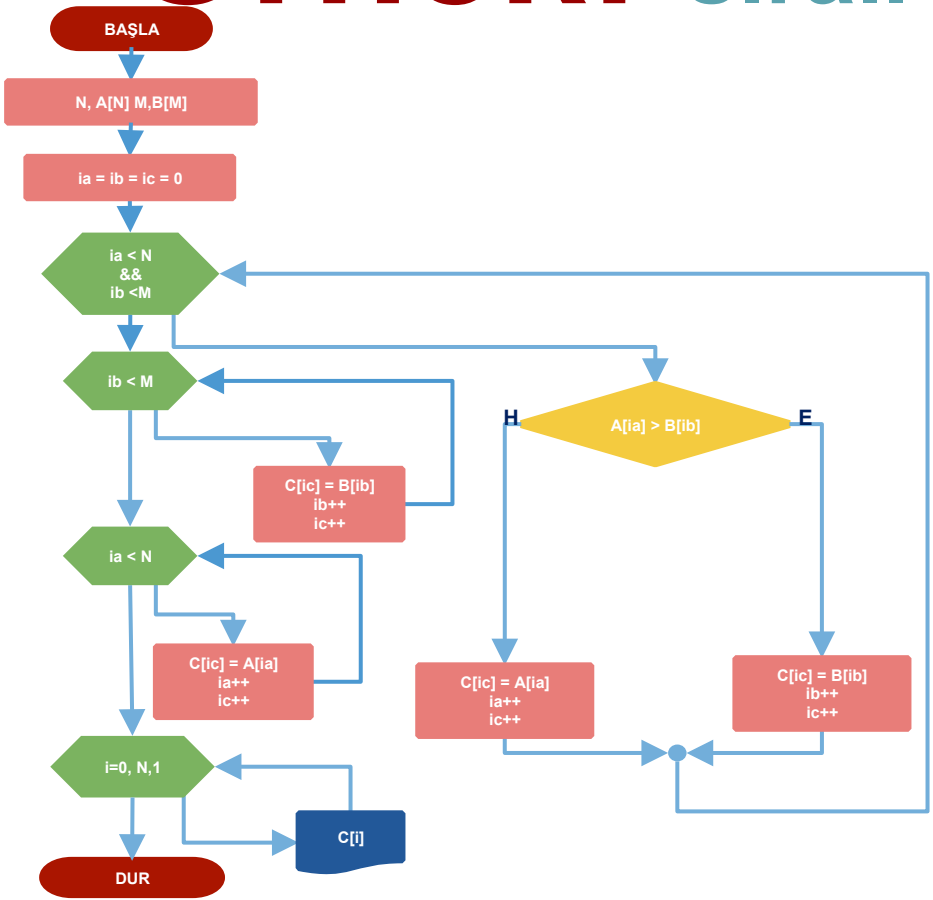
	i	j			
12	4	15	7	9	
2	5	1	4	3	

```
#include <stdio.h>
void main()
{
    int N=5,T,elde,i,j;
    int A[]={12,4,15,7,9};
    int Y[5];
    for(i=N-1;i>-1;i--)          Y[i] = 1;
    for(i=0;i<N;i++){
        for(j=i+1;j<N;j++){
            if(A[j]<A[i]){
                Y[j]++;
            }else{
                Y[i]++;
            }
        }
    }
    for(i=0;i<N;i++)
                printf("%3d",A[i]);
    printf("\n");
    for(i=0;i<N;i++)
                printf("%3d",Y[i]);
}
```

Örnek: sıralı dizileri birlestirme

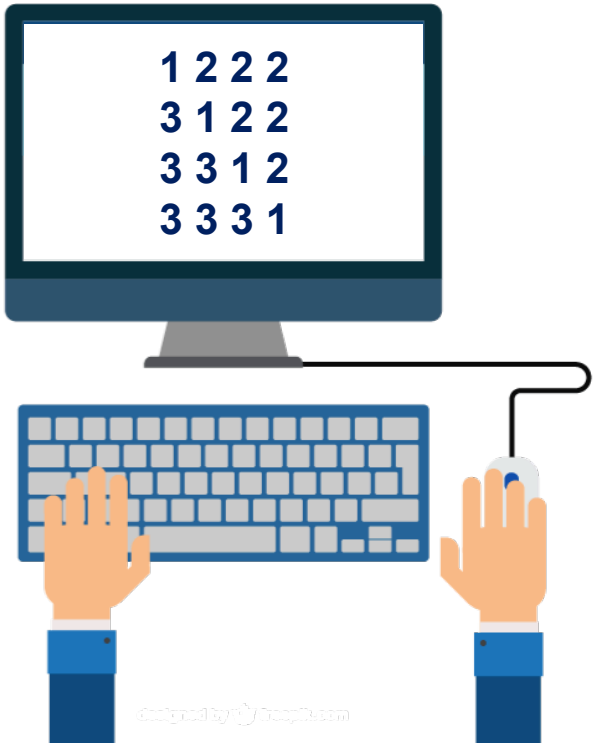


Örnek: sıralı dizileri birlestirme

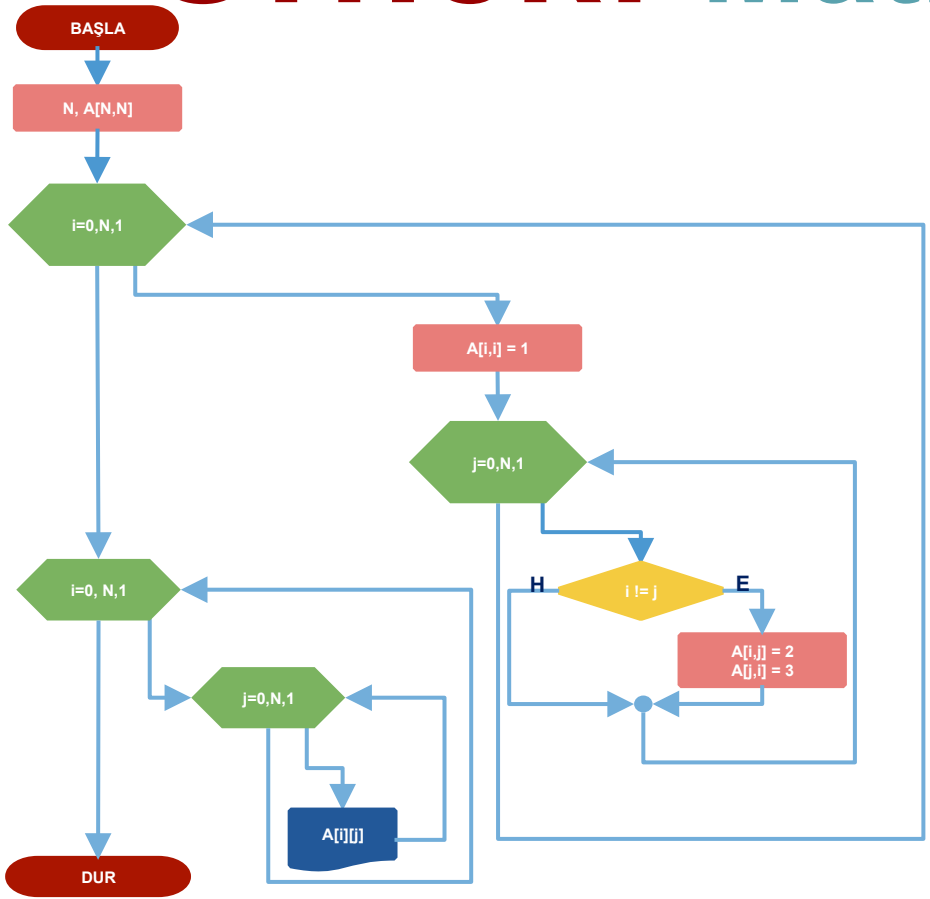



```c
#include <stdio.h>
void main()
{
  int N=6,M=4,ia=0,ib=0,ic=0,i;
  int A[] = {1,3,5,7,8,9};
  int B[] = {2,6,10,13};
  int C[10];
  while(ia<N && ib<M){
   if(A[ia]>B[ib]){
      C[ic] = B[ib];
      ib++; ic++;
   }else{
      C[ic] = A[ia];
      ia++; ic++;
   }
  }
  while(ib<M){
   C[ic] = B[ib];
      ib++; ic++;
  }
  while(ia<N){
   C[ic] = A[ia];
      ia++; ic++;
  }
  for(i=0;i<N+M;i++){
   printf("%d ",C[i]);
  }
}
```

Örnek: Matris diagonali

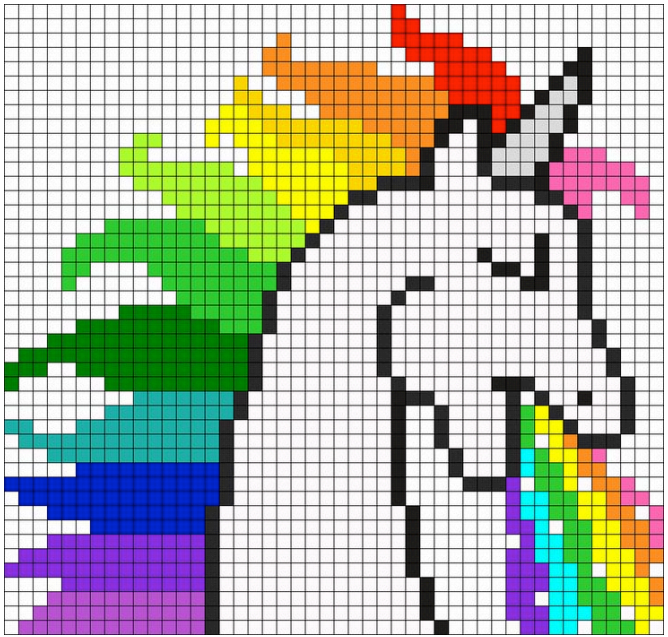


Örnek: Matris diagonali



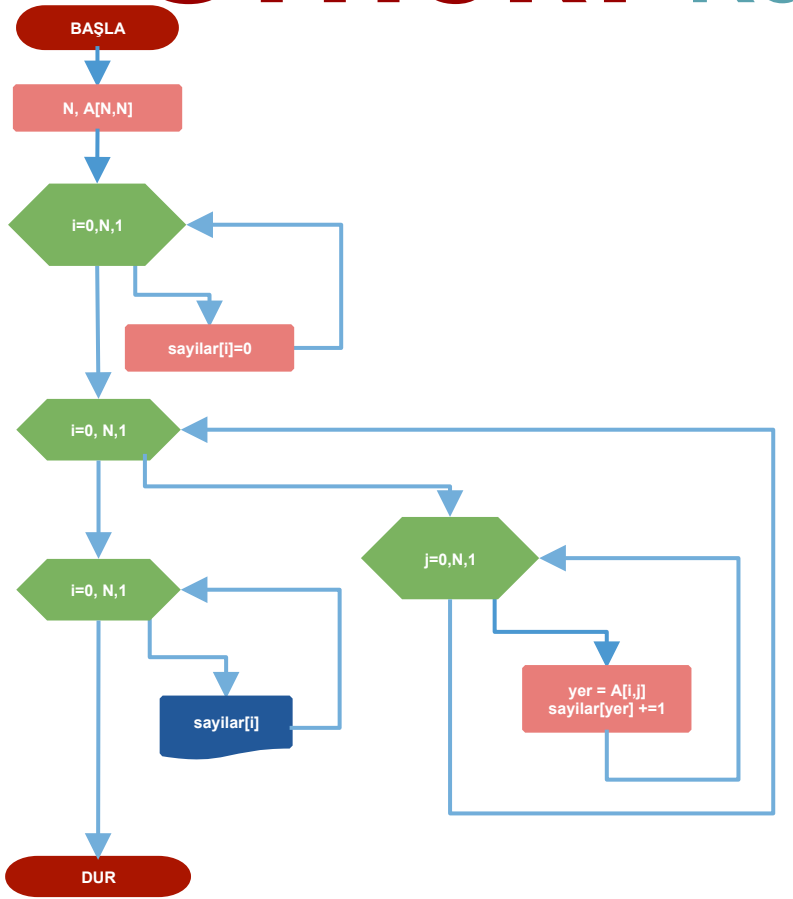

```c
#include <stdio.h>
void main()
{
   int N=4,i,j;
   int A[4][4]={{1,2,3,4},
                {5,6,7,8},
                {9,10,11,12},
                {13,14,15,16}};
   for(i=0;i<N;i++){
      A[i][i]=1;
      for(j=0;j<N;j++){
         if(i!=j){
            A[i][j]=2;
            A[j][i]=3;
         }
      }
   }
   for(i=0;i<N;i++){
      for(j=0;j<N;j++){
        printf("%d",A[i][j]);
      }
      printf("\n");
   }
}
```

Örnek: Resimdeki renk sayısı



```
int resim[4][4]=
{
        { 0, 1, 2, 3},
        { 4, 5, 6, 7},
        { 8, 9, 1, 2},
        { 3, 3, 2, 2}
};
```

Örnek: Resimdeki renk sayısı




```c
#include <stdio.h>
void main()
{
   int N=4,i,j,yer;
   int sayilar[16];
   int A[4][4]={{0,1,2,3},
                {4,5,6,7},
                {8,9,1,2},
                {3,3,2,2}};
   for(i=0;i<10;i++){
      sayilar[i]=0;
   }
   for(i=0;i<N;i++){
      for(j=0;j<N;j++){
         yer = A[i][j];
         sayilar[yer] +=1;
      }
   }
   for(i=0;i<10;i++){
     printf("%d",sayilar[i]);
   }
}
```

Sorular