

Suhap SAHIN

Veri Tipi	Byte(8 bit)
char	8

Veri Tipi	Byte(8 bit)
char	8
byte	8

Veri Tipi	Byte(8 bit)
char	8
byte	8
short	16

Veri Tipi	Byte(8 bit)
char	8
byte	8
short	16
int	32

Veri Tipleri

Veri Tipi	Byte(8 bit)
char	8
byte	8
short	16
int	32
long	64

Veri Tipi	Byte(8 bit)
char	8
byte	8
short	16
int	32
long	64
float	32

Veri Tipleri

Veri Tipi	Byte(8 bit)
char	8
byte	8
short	16
int	32
long	64
float	32
double	64

Veri Tipleri

Veri Tipi	Byte(8 bit)
char	8
byte	8
short	16
int	32
long	64
float	32
double	64
boolean	1

Operator	islem
~	1' tümleyen

Operator	islem
~	1' tümleyen
>>	Saga Kaydırma

Operator	islem
~	1' tümleyen
>>	Saga Kaydırma
<<	Sola Kaydırma

Operator	islem
~	1'tümleyen
>>	Saga Kaydırma
<<	Sola Kaydırma
&	Bit düzeyinde AND

Operator	islem
~	1' tümleyen
>>	Saga Kaydırma
<<	Sola Kaydırma
&	Bit düzeyinde AND
/	Bit düzeyinde OR

Operator	islem
~	1' tümleyen
>>	Saga Kaydırma
<<	Sola Kaydırma
&	Bit düzeyinde AND
/	Bit düzeyinde OR
^	Bit düzeyinde XOR

Giris (Bitler	AND	OR	XOR
0	0	0	0	0
0	1			
1	0			
1	1			

Giris (Bitler	AND	OR	XOR
0	0	0	0	0
0	1	0	1	1
1	0			
1	1			

Giris E	Bitler	AND	OR	XOR
0	0	0	0	0
0	1	0	1	1
1	0	0	1	1
1	1			

Giris (Bitler	AND	OR	XOR
0	0	0	0	0
0	1	0	1	1
1	0	0	1	1
1	1	1	1	0

Operatör	Kullanımı
~	Bir biti terslemek

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&	Saklayıcının belirli kısmını maskelemek

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<<	Bitleri sola kaydırmak

Operatör	Kullanımı
~	Bir biti terslemek
&	Saklayıcının belirli kısmını maskelemek
<<	Bitleri sola kaydırmak
>>	Bitleri saga kaydırmak



```
#include<stdio.h>
int main()
{
     int a=12;
     int b=10;

     return(0);
}
```

$$a = 12 = (0000\ 0000\ 0000\ 1100)_2$$

 $b = 10 = (0000\ 0000\ 0000\ 1010)_2$



```
#include<stdio.h>
int main()

{
    int a=12;
    int b=10;
    printf("\nNumber1 AND Number2 : %d",a & b);

    return(0);
}

a = 12 = (0000\ 0000\ 0000\ 1100)_{2}

b = 10 = (0000\ 0000\ 0000\ 1010)_{2}

a = 0000\ 0000\ 0000\ 1100

a = 0000\ 0000\ 0000\ 1100
```



```
#include<stdio.h>
int main()
      int a=12;
      int b=10;
      printf("\nNumber1 AND Number2 : %d",a & b);
      return(0);
                       Number1 AND Number2: 8
```

$$a = 12 = (0000\ 0000\ 0000\ 1100)_2$$

 $b = 10 = (0000\ 0000\ 0000\ 1010)_2$

0000 0000 0000 1000

a & b



```
#include<stdio.h>
int main()
{
    int a=12;
    int b=10;
    printf("\nNumber1 AND Number2 : %d",a & b);
    printf("\nNumber1 OR Number2 : %d",a | b);

    return(0);
}
```

Number1 AND Number2 : 8

$$a = 12 = (0000\ 0000\ 0000\ 1100)_2$$

 $b = 10 = (0000\ 0000\ 0000\ 1010)_2$



```
#include<stdio.h>
int main()
{
    int a=12;
    int b=10;
    printf("\nNumber1 AND Number2 : %d",a & b);
    printf("\nNumber1 OR Number2 : %d",a | b);

    return(0);
}
```

Number1 AND Number2 : 8 Number1 OR Number2 : 14

$$a = 12 = (0000\ 0000\ 0000\ 1100)_2$$

 $b = 10 = (0000\ 0000\ 0000\ 1010)_2$

a | b 0000 0000 0000 1110



```
#include<stdio.h>
int main()
{
    int a=12;
    int b=10;
    printf("\nNumber1 AND Number2 : %d",a & b);
    printf("\nNumber1 OR Number2 : %d",a | b);
    printf("\nNumber XOR Number2 : %d",a ^ b);
    return(0);
}
```

Number1 AND Number2 : 8 Number1 OR Number2 : 14

$$a = 12 = (0000\ 0000\ 0000\ 1100)_2$$

 $b = 10 = (0000\ 0000\ 0000\ 1010)_2$

a ^ b 0000 0000 0000 0110



```
#include<stdio.h>
int main()
{
    int a=12;
    int b=10;
    printf("\nNumber1 AND Number2 : %d",a & b);
    printf("\nNumber1 OR Number2 : %d",a | b);
    printf("\nNumber XOR Number2 : %d",a ^ b);
    return(0);
}
```

Number1 AND Number2 : 8 Number1 OR Number2 : 14 Number1 XOR Number2 : 6

$$a = 12 = (0000\ 0000\ 0000\ 1100)_2$$

 $b = 10 = (0000\ 0000\ 0000\ 1010)_2$

0000 0000 0000 0110

a ^ b

Saga Bit Kaydırma [>>]

Verinin hareket yönü

Saga Bit Kaydırma ())

Verinin hareket yönü

Orjinal Sayı A

0000 0000 0011 1100

Saga Bit Kaydırma [>>]

Verinin hareket yönü

Orjinal Sayı A

0000 0000 0011 1100

1 bit kaydırma

00000 0000 0011 110

Saga Bit Kaydırma []]

```
#include<stdio.h>
int main()
{
    int a = 60;

    return(0);
}

a 0000 0000 0011 1100
```

Saga Bit Kaydırma []]

```
#include<stdio.h>
int main()
      int a = 60;
      printf("\nNumber is Shifted By 1 Bit: %d",a >> 1);
      return(0);
                   Number is Shifted By 1 Bit: 30
```

a a >> 1 0000 0000 0011 1100 0000 0000 0001 1110

Saga Bit Kaydırma ())

```
#include<stdio.h>
int main()
      int a = 60;
      printf("\nNumber is Shifted By 1 Bit: %d",a >> 1);
      printf("\nNumber is Shifted By 2 Bits: %d",a >> 2);
      return(0);
                   Number is Shifted By 1 Bit: 30
                   Number is Shifted By 2 Bits: 15
```

a 0000 0000 0011 1100 a >> 1 0000 0000 0001 1110 a >> 2 0000 0000 0000 1111

Saga Bit Kaydırma ())

```
#include<stdio.h>
int main()
{
    int a = 60;
    printf("\nNumber is Shifted By 1 Bit : %d",a >> 1);
    printf("\nNumber is Shifted By 2 Bits : %d",a >> 2);
    printf("\nNumber is Shifted By 3 Bits : %d",a >> 3);

    return(0);
}
```

Number is Shifted By 1 Bit : 30 Number is Shifted By 2 Bits : 15 Number is Shifted By 3 Bits : 7 a 0000 0000 0011 1100 a >> 1 0000 0000 0001 1110 a >> 2 0000 0000 0000 1111 a >> 3 0000 0000 0000 0111

Verinin hareket yönü

Verinin hareket yönü

50 4444======

Orjinal Sayı A

0000 0000 0011 1100

Verinin hareket yönü

50(< < < < = = = = = =

Orjinal Sayı A

0000 0000 0011 1100

1 bit kaydırma

0000 0000 0111 1000

```
#include<stdio.h>
int main()
{
    int a = 60;

    return(0);
}

a 0000 0000 0011 1100
```

```
#include<stdio.h>
int main()
      int a = 60;
      printf("\nNumber is Shifted By 1 Bit: %d",a << 1);
      return(0);
                   Number is Shifted By 1 Bit: 120
```

a 0000 0000 0011 1100 a << 1 0000 0000 0111 1000

```
#include<stdio.h>
int main()
{
    int a = 60;
    printf("\nNumber is Shifted By 1 Bit : %d",a << 1);
    printf("\nNumber is Shifted By 2 Bits : %d",a << 2);

    return(0);
}</pre>
```

Number is Shifted By 1 Bit : 120 Number is Shifted By 2 Bits : 240 a 0000 0000 0011 1100 a << 1 0000 0000 0111 1000 a << 2 0000 0000 1111 0000

```
#include<stdio.h>
int main()
{
    int a = 60;
    printf("\nNumber is Shifted By 1 Bit : %d",a << 1);
    printf("\nNumber is Shifted By 2 Bits : %d",a << 2);
    printf("\nNumber is Shifted By 3 Bits : %d",a << 3);
    return(0);
}</pre>
```

Number is Shifted By 1 Bit : 120 Number is Shifted By 2 Bits : 240 Number is Shifted By 3 Bits : 480

а	0000 0000 0011 1100
a << 1	0000 0000 0111 1000
a << 2	0000 0000 1111 0000
a << 3	0000 0001 1110 0000

Gerekli verilerin tutulup ve kalanının maskelenmesi (bloke edildigi)

Gerekli verilerin tutulup ve kalanının maskelenmesi (bloke edildigi)

En Sik Kullanılan Operatör: AND (&)

0000 0000 100 1 01 01

(veri)

Gerekli verilerin tutulup ve kalanının maskelenmesi (bloke edildigi)

En Sik Kullanılan Operatör: AND (&)

0000 0000 100 101 01 (veri)

Gerekli verilerin tutulup ve kalanının maskelenmesi (bloke edildigi)

	0000 0000 100 1 01 01	(veri)
AND	0000 0000 000 111 00	(maske)

Gerekli verilerin tutulup ve kalanının maskelenmesi (bloke edildigi)

	0000 0000 100 1 01 01	(veri)
AND.	0000000000011100	(maske)

Gerekli verilerin tutulup ve kalanının maskelenmesi (bloke edildigi)

	0000 0000 100 1 01 01	(veri)
AND	0000 0000 000 111 00	(maske)
	0000000000010100	(maskelenmis veri)

Bit Kayorma (Negatif Sayılar)

```
#include<stdio.h>
void main()
{
     printf("%x",-1<<4);
}</pre>
```



-1	FFFFFFF		1111
-1 << 1	FFFFFF <mark>E</mark>	1111 1111 1111 1111 1111 1111 1111 [.]	1110
-1 << 2	FFFFFFD	1111 1111 1111 1111 1111 1111 1111 :	1100
-1 << 3	FFFFFF8	1111 1111 1111 1111 1111 1111 1111 [.]	1000
-1 << 4	FFFFFF <mark>0</mark>	1111 1111 1111 1111 1111 1111 1111 (0000

Bit Kaydırma (Negatif Sayılar)

```
#include<stdio.h>
void main()
{
     printf("%x",-1<<4);
}</pre>
```

FFFFFF0

Bit Kaydırma (Negatif Sayılar)

```
#include<stdio.h>
int main()
{
    int a = -60;
    printf("\nNegative Right Shift by 1 Bit : %",a >> 1);
    return(0);
}
```

Negative Right Shift by 1 Bit :-30

Bit Kaydırma (Negatif Sayılar)

```
#include<stdio.h>
int main()
{
    int a = -60;

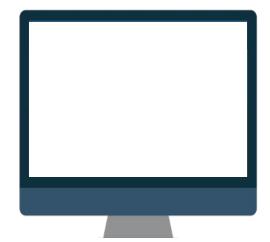
    printf("\nNegative Right Shift by 1 Bit : %",a >> 1);
    printf("\nNegative Right Shift by 2 Bits : %d",a >> 2);
    printf("\nNegative Right Shift by 3 Bits : %d",a >> 3);

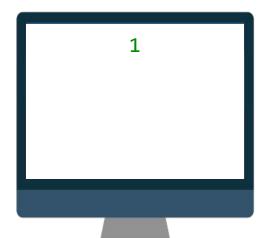
    return(0);
}
```

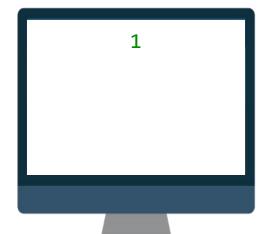
Negative Right Shift by 1 Bit : -30 Negative Right Shift by 2 Bits : -15 Negative Right Shift by 3 Bits : -8

```
#include<stdio.h>
main()
{
    int i;
    for(i=0;i<5;i++)</pre>
```

```
#include<stdio.h>
main()
{
        int i;
        for(i=0;i<5;i++)
            printf("%d\n", 1 << i);
}</pre>
```



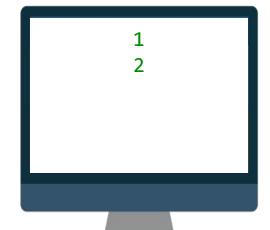




```
#include<stdio.h>
main()
{
        int i;
        for(i=0;i<5;i++)
            printf("%d\n", 1 << i);
}</pre>
```

```
1 00000001
1 << 0 00000001
1 << 1 00000002
```

0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0000 0000 0001 0000 0000 0000 0000 0000 0010



```
#include<stdio.h>
main()
{
     int i;
     for(i=0;i<5;i++)
          printf("%d\n", 1 << i);
}</pre>
```

```
1
2
4
```

1	00000001
1 << 0	00000001
1 << 1	00000002
1 << 2	00000004

```
#include<stdio.h>
main()
{
     int i;
     for(i=0;i<5;i++)
         printf("%d\n", 1 << i);
}</pre>
```

```
1
2
4
8
```

1	00000001
1 << 0	00000001
1 << 1	00000002
1 << 2	00000004
1 << 3	8000000

```
#include<stdio.h>
main()
{
        int i;
        for(i=0;i<5;i++)
            printf("%d\n", 1 << i);
}</pre>
```

```
1
2
4
8
16
```

1	00000001
1 << 0	00000001
1 << 1	00000002
1 << 2	00000004
1 << 3	80000000
1 << 4	00000010

l'e tuniene

Orjinal Sayı A 0000 0000 0011 1100

i e tum eme

Orjinal Sayı A 0000 0000 0011 1100

1100

0011

1'e Tümlenmis A 1111 1111

i e tum eme

a

```
#include<stdio.h>
int main()
{
    int a=10;
}
```

0000 0000 0000 1010

le tumleme

```
#include<stdio.h>
int main()
      int a=10;
      printf("\nNegation of Number 10 : %d",~a);
      return(0);
```

0000 0000 0000 1010 1111 1111 1111 **0101**

le tumleme

```
#include<stdio.h>
int main()
{
    int a=10;
    printf("\nNegation of Number 10 : %d",~a);
    return(0);
}
```

Negation of Number 10 : -11

0000 0000 0000 1010 1111 1111 1111 **0101**

le tumleme

```
#include<stdio.h>
int main()
{
    int a=10;
    printf("\nNegation of Number 10 : %d",~a);
    return(0);
}
```

Negation of Number 10 : -11

0000 0000 0000 1010 1111 1111 1111 **0101**



```
#define BIT_GET(VAR, BIT_NO) ( VAR >> BIT_NO )
```

```
VAR 1100
BIT_NO = 0 => VAR >> BIT_NO 1100
BIT_NO = 1 => VAR >> BIT_NO 0110
BIT_NO = 2 => VAR >> BIT_NO 0011
BIT_NO = 3 => VAR >> BIT_NO 0001
```



#define BIT_GET(VAR, BIT_NO) ((VAR >> BIT_NO) & 1)

&	VAR 1	=	011 <mark>0</mark> 0001
			0000

	VAR	1100
BIT_NO = 0 =>	VAR >> BIT_NO	1100
BIT_NO = 1 =>	VAR >> BIT_NO	0110
BIT_NO = 2 =>	VAR >> BIT_NO	0011
BIT_NO = 3 =>	VAR >> BIT_NO	0001



#define BIT_GET(VAR, BIT_NO) ((VAR >> BIT_NO) & 1)

	VAR	1100
BIT_NO = 0 =>	VAR >> BIT_NO	1100
BIT_NO = 1 =>	VAR >> BIT_NO	0110
BIT_NO = 2 =>	VAR >> BIT_NO	0011
BIT_NO = 3 =>	VAR >> BIT_NO	0001



#define BIT_GET(VAR, BIT_NO) ((VAR >> BIT_NO) & 1)

&	VAR 1	=	001 <mark>1</mark> 0001
			0001

	VAR	1100
BIT_NO = 0 =>	VAR >> BIT_NO	1100
BIT_NO = 1 =>	VAR >> BIT_NO	0110
BIT_NO = 2 =>	VAR >> BIT_NO	0011
BIT_NO = 3 =>	VAR >> BIT_NO	0001



	1	0001
BIT_NO = 0 =>	1 << BIT_NO	0001
BIT_NO = 1 =>	1 << BIT_NO	0010
BIT_NO = 2 =>	1 << BIT_NO	0100
BIT_NO = 3 =>	1 << BIT_NO	1000



```
#define BIT_SET(VAR, BIT_NO) do {
    VAR |= 1<<BIT_NO;
} while (0)</pre>
```

	1	0001
BIT_NO = 0 =>	1 << BIT_NO	0001
BIT_NO = 1 =>	1 << BIT_NO	0010
BIT_NO = 2 =>	1 << BIT_NO	0100
BIT_NO = 3 =>	1 << BIT_NO	1000



```
1 0001
BIT_NO = 0 => 1 << BIT_NO 0001
BIT_NO = 1 => 1 << BIT_NO 0010
BIT_NO = 2 => 1 << BIT_NO 0100
BIT_NO = 3 => 1 << BIT_NO 1000
```



```
#define BIT_RESET(VAR, BIT_NO) do {
    VAR &= ~(1<<BIT_NO);
} while (0)</pre>
```

	1	0001
BIT_NO = 0 =>	1 << B	IT_NO 0001
BIT_NO = 1 =>	1 << B	IT_NO 0010
BIT_NO = 2 =>	1 << B	IT_NO 01100
BIT_NO = 3 =>	1 << B	IT_NO1000



```
1 0001
BIT_NO = 0 => 1 << BIT_NO 0001
BIT_NO = 1 => 1 << BIT_NO 0010
BIT_NO = 2 => 1 << BIT_NO 0100
BIT_NO = 3 => 1 << BIT_NO 1000
```



```
#define BIT_TOGGLE(VAR, BIT_NO) do {
    VAR ^= (1<<BIT_NO);
} while (0)</pre>
```

	1	0001
BIT_NO = 0 =>	1 << B	IT_NO 0001
BIT_NO = 1 =>	1 << B	IT_NO 001 <mark>0</mark>
BIT_NO = 2 =>	1 << B	IT_NO 01100
BIT_NO = 3 =>	1 << B	IT_NO1000



```
#define BIT_SET(VAR, BIT_NO) do {
   VAR |= 1<<BIT_NO;
} while (0)</pre>
```

```
8 b.push(a[c]); } return b;

function h() {

#User | (a(a), a = q(a), a =
```



```
#define BIT_SET(VAR, BIT_NO) do {
   VAR |= 1<<BIT_NO;
} while (0)

#define BIT_RESET(VAR, BIT_NO) do {
   VAR &= ~(1<<BIT_NO);
} while (0)</pre>
```





```
#define BIT_SET(VAR, BIT_NO) do {
   VAR |= 1<<BIT_NO;
} while (0)

#define BIT_RESET(VAR, BIT_NO) do {
   VAR &= ~(1<<BIT_NO);
} while (0)

#define BIT_TOGGLE(VAR, BIT_NO) do {
   VAR ^= (1<<BIT_NO);
} while (0)</pre>
```





```
#define BIT_SET(VAR, BIT_NO) do {
    VAR |= 1<<BIT_NO;
} while (0)

#define BIT_RESET(VAR, BIT_NO) do {
    VAR &= ~(1<<BIT_NO);
} while (0)

#define BIT_TOGGLE(VAR, BIT_NO) do {
    VAR ^= (1<<BIT_NO);
} while (0)

#define BIT_GET(VAR, BIT_NO) ((VAR >> BIT_NO) & 1)
```

```
8 b.push(a[c]); | return b; for (var a = s() for () for (var a = s() for () fo
```



```
void print_bit(int var, int bit_count) {
    printf("\n");
}
```

```
8 b.push(a[c]); | return b; | for (var a = 1) | for (var a = 1)
```



```
void print_bit(int var, int bit_count) {
   int i;
   for (i = bit_count-1 ; i >= 0 ; i--) {
    }
    printf("\n");
}
```

```
8 b.push(a[c]); | return b; for (var a = 1); | fo
```



```
void print_bit(int var, int bit_count) {
    int i;
    for (i = bit_count-1 ; i >= 0 ; i--) {
        printf("%d", BIT_GET(var, i));
    }
    printf("\n");
}
```

```
8 b.push(a[c]); | return b; for (var a = s); | fo
```



```
#include<stdio.h>
int main() {
    int a = 0b0011;
    print_bit(a, 4);
```

```
return 0;
```



```
#include<stdio.h>
int main() {
    int a = 0b0011;
    print_bit(a, 4);
    BIT_SET(a, 0);
    print_bit(a, 4);
```

```
8 b.push(a[c]); } return b; for (var a = (a), a = q(a), a | q(
```

```
return 0;
```



```
#include<stdio.h>
int main() {
    int a = 0b0011;
    print_bit(a, 4);
    BIT_SET(a, 0);
    print_bit(a, 4);
    BIT_RESET(a, 2);
    print_bit(a, 4);
```

```
return 0;
```



```
#include<stdio.h>
int main() {
    int a = 0b0011;
    print_bit(a, 4);
    BIT_SET(a, 0);
    print_bit(a, 4);
    BIT_RESET(a, 2);
    print_bit(a, 4);
    BIT_TOGGLE(a, 3);
    print_bit(a, 4);
```

return 0;

```
8 b.push(a[c]); | return b; | for (var a = 1) | for (var a = 1)
```



```
#include<stdio.h>
int main() {
  int a = 0b0011;
  print_bit(a, 4);
  BIT_SET(a, 0);
  print_bit(a, 4);
  BIT_RESET(a, 2);
  print_bit(a, 4);
  BIT_TOGGLE(a, 3);
  print_bit(a, 4);
  printf("a'nin 0. biti: %d\n", BIT_GET(a, 0));
  printf("a'nin 1. biti: %d\n", BIT_GET(a, 1));
  printf("a'nin 2. biti: %d\n", BIT_GET(a, 2));
  printf("a'nin 3. biti: %d\n", BIT GET(a, 3));
  return 0;
```

```
8 b.push(a[c]); } return b;

function h() {

#User | (3e) |

place (/ (3e) | (3e) | (3e) |

place (/ (3e) | (3e) | (3e) |

p
```

SOFULAT

