

# 7

“The slap of a friend can be trusted to help you.”

## The Magic XOR

The powerful XOR operator (^) is rarely used by Indian C Programmers. Let’s see some of its uses.

### 7.1 Swap Macro

The XOR operator is widely used for swapping integers as

```
#define SWAP(x, y)    (x ^= y ^= x ^= y)
```

But this doesn’t work with floating point values. It also doesn’t work when we send values as SWAP (a, a).

#### Note

XOR(^) operator works only with integer data types like char, int. It does not work with float or double.

### 7.2 Flip and Flop

One of the most important use of XOR is that we can generate the integer sequence like 1, 13, 1, 13, 1, 13.... very easily. Such an operation is sometimes referred as *toggling* of values.

```
int main( void )
{
    int i, n;
    for( i=0, n=1; i<10; ++i, n ^= (1^13) )
        printf( "%d", n );
    return(0);
}
```

#### Output

1, 13, 1, 13, 1, 13, 1, 13, 1, 13

### 7.3 Crypting with XOR

Some people use complementary operator (~) for easy crypting. Since such technique doesn’t have any ‘key’ values, it is easy to decrypt the file. XOR provides an easy way to crypt and decrypt with ‘key’ support.

```
int CryptOrDecrypt( int ch )
{
    key = 'a';
    return( ch^key );
}
```

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```
int main( void )
{
    int ch;
    FILE *fp = fopen("test.dat", "r+");
    while( !feof(fp) )
    {
        ch = fgetch(fp);
        ch = CryptOrDecrypt(ch);
        fseek(fp, SEEK_CUR, -1);
        fputc(fp, ch);
    }
    fclose(fp);
}
```

Now you can crypt or decrypt your file with a single function `CryptOrDecrypt( )`. If you want to send some crypted message to someone else, both of you must have this `CryptOrDecrypt( )` function.

### Caution

'key' value should not be 0. If key value is 0, the line will not be crypted because  $N^0=N$ .