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The C Programming Language in Action



How to Set Clear and Toggle a single bit in C/C++

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BY AMLENDRA (<https://aticleworld.com/author/pritosh/>) ON MAY 1, 2016  
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Bitwise operators are used in C programming and using the bit-wise operators, we can manipulate the bits of an integral type. In the C programming language, we can only use to perform the bit-wise operations on the integer or Register.

**Note:** Here I assume that bit of register start with 0th position, it means 2nd position is actually 3rd bits.

[\(https://pluralsight.com/courses/c-programming-questions-answers-bit-wise-operator-part-1/\)](https://pluralsight.com/courses/c-programming-questions-answers-bit-wise-operator-part-1/)

**Note:** Here I assume that bit of register start with 0th position, it means 2nd position is actually 3rd bits.

D7	D6	D5	D4	D3	D2	D1	D0
----	----	----	----	----	----	----	----

### Setting a Bits

Bitwise OR operator (|) use to set a bit of integral data type. "OR" of two bits is always one if any one of them is one.

Algorithm to set the bits

Number  $i = (1 \leq \text{nth Position})$   
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```
ant set = ");
```

```
l be = 0x%x\n", iPos, cData);
```

Output

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```
cData = 0x0
```

```
Enter the position which you want set = 2
```

```
2th Bit Set Now cData will be = 0x4
```

## Clearing a Bits

Bitwise AND operator (&) use to clear a bit of integral data type. "AND" of two bits is always zero if any one of them is zero.

### Algorithm to clear the bits

Number  $\&= \sim (1 \ll \text{nth Position})$

To clear the nth bit, first you need to invert the string of bits then AND it with number.

### Simple program to clear a bit

```
1 #include <stdio.h>
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```

```
2 #include <stdlib.h>
3
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```

```
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10 ata);
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```

```
12 ant clear = ");
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## Checking a Bits

To check the nth bit, shift the '1' nth position toward the left and then "AND" it with the number.

An algorithm to check the bits

Bit = Number & (1 << nth)

Simple program to check a bit

```
1 #include <stdio.h>
2 #include <stdlib.h>
```

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OutPut 2:

```
Initially cData = 0xfc
Enter the position which you want check = 3
Bit is One
```

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## Toggle a Bits

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Bitwise XOR (^) operator use to toggle the bit of an integral data type. To toggle the bit of a variable, we shift the left and "XOR" it.

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17 u=https://pluralsight.com/courses/the-c-programming-language-in-action)
18 //Print the data
19 printf("\n\n%dth Bit Set Now cData will be = 0x%x\n",iPos,cData);
20
21
22
23 return 0;
24 }
```

OutPut 1:

```
Initially cData = 0xf8
Enter the position which you want toggle = 3

3th Bit Set Now cData will be = 0xf0
```

OutPut 2:

```
Initially cData = 0xf8
Enter the position which you want toggle = 1
```

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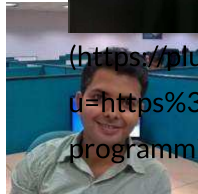
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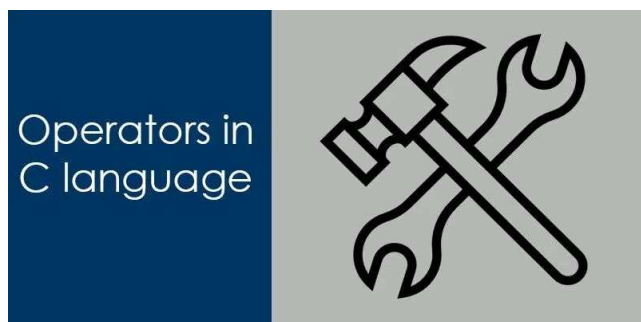
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I am an embedded c software engineer and a corporate trainer, currently, I am working as senior software engineer in a largest Software consulting company . I have working experience of different microcontrollers (stm32, LPC, PIC AVR and 8051), drivers (USB and virtual com-port), POS device (VeriFone) and payment gateway (global and first data).

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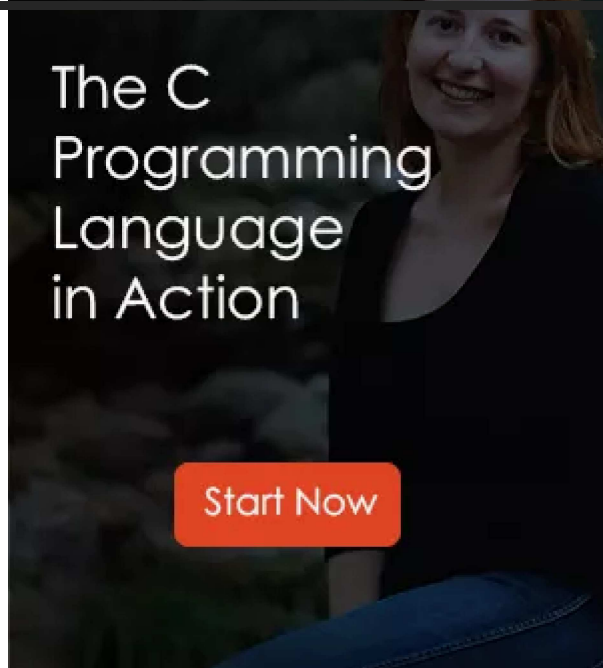
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