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Computer Programming And Technology For Dummies

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SUNDAY, 14 JULY 2013

C program to set, reset, check, clear and toggle a bit

Write a C program to set, reset, check, clear and toggle a bit.

How to set a bit?
value = data | (1 << n)). Where data is the input value and n be bit to be set.
Note: Bits starts from 0 to 7 (0000 0000). Least Significant Bit is the 0th bit.

Example: Input data is 8
Bit needs to be set is 2
value = (0000 1000) | (0000 0001 << 2) => 0000 1100 => 12

How to check a bit is set or unset?
value = data & (1 << n)

Example: Input data is 8
Bit needs to be checked is 3
value = (0000 1000) | (0000 0001 << 3) => 1
Third bit set in the given input value.

How to clear a bit?
value = data & ~(1 << n)

Example: Input data is 8
Bit needs to cleared is 3
value = (0000 1000) & (~(0000 0001 << 3))
= (0000 1000) & (~(0000 1000))
= (0000 1000) & (1111 0111) = 0

How to toggle a bit?
value = data ^ (1 << n)

Example: Input data is 8
Bit needs to be toggled is 2.
value = (0000 1000) ^ (0000 0001 << 2)
= (0000 1000) ^ (0000 0100) => (0000 1100) = 12

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

int main() {
    int ch, n, input;
    while (1) {
        printf("\nNote: 1 byte = 8 bits(0 - 7)\n");
        printf("1. Set nth Bit\t2. Reset nth Bit\n");
        printf("3. Check a Bit\t4. Clear nth Bit\n");
        printf("5. Toggle a Bit\t6. Exit\n");
        printf("Enter your choice:");
        scanf("%d", &ch);
        if (ch != 6) {
            printf("Enter your input value:");
            scanf("%d", &input);
            printf("Enter the value for n(nth bit):");
            scanf("%d", &n);
        }
        switch(ch) {
            case 1:
```

```
                        /* setting nth bit */
                        input = input | (1 << n);
                        printf("Result: %d\n", input);
                        break;
                case 2:
                        /* reset operation */
                        input = input & (~0);
                        printf("Result: %d\n", input);
                        break;
                case 3:
                        /* check a bit is set or not */
                        input = input & (1 << n);
                        printf("Bit %d is %s\n", n, input?"set":"unset");
                        break;
                case 4:
                        /* clear nth bit */
                        input = input & (~(1 << n));
                        printf("Result: %d\n", input);
                        break;
                case 5:
                        /* toggle a bit */
                        input = input ^ (1 << n);
                        printf("Result: %d\n", input);
                        break;
                case 6:
                        exit(0);
                default:
                        printf("Wrong Option!!\n");
                        break;
        }

    }
    return 0;
}
```

Output:

```
jp@jp-VirtualBox:~/$ ./a.out
Note: 1 byte = 8 bits(0 - 7)
1. Set nth Bit 2. Reset nth Bit
3. Check a Bit4. Clear nth Bit
5. Toggle a Bit       6. Exit
Enter your choice:1
Enter your input value:8
Enter the value for n(nth bit):2
Result: 12

Note: 1 byte = 8 bits(0 - 7)
1. Set nth Bit 2. Reset nth Bit
3. Check a Bit4. Clear nth Bit
5. Toggle a Bit       6. Exit
Enter your choice:2
Enter your input value:8
Enter the value for n(nth bit):3
Result: 8

Note: 1 byte = 8bits(0 - 7)
1. Set nth Bit 2. Reset nth Bit
3. Check a Bit4. Clear nth Bit
5. Toggle a Bit       6. Exit
Enter your choice:3
Enter your input value:8
Enter the value for n(nth bit):3
Bit 3 is set

Note: 1 byte = 8 bits(0 - 7)
1. Set nth Bit 2. Reset nth Bit
3. Check a Bit4. Clear nth Bit
5. Toggle a Bit       6. Exit
Enter your choice:4
Enter your input value:8
Enter the value for n(nth bit):3
Result: 0

Note: 1 byte = 8 bits(0 - 7)
1. Set nth Bit 2. Reset nth Bit
3. Check a Bit4. Clear nth Bit
5. Toggle a Bit       6. Exit
Enter your choice:5
Enter your input value:8
Enter the value for n(nth bit):2
Result: 12
```

```
Note: 1 byte = 8 bits(0 - 7)
1. Set nth Bit 2. Reset nth Bit
3. Check a Bit4. Clear nth Bit
5. Toggle a Bit       6. Exit
Enter your choice:6
```

Posted by CProgrammer at 13:34

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Labels: Logical operator programs

1 comment:

1. *sachendra niranjan*30 August 2016 at 10:24

   please correct below Example -:
   Example: Input data is 8
   Bit needs to be checked is 3
   value = (0000 1000) | (0000 0001 << 3) => 1
   Third bit set in the given input value.

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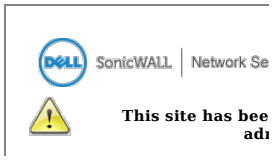

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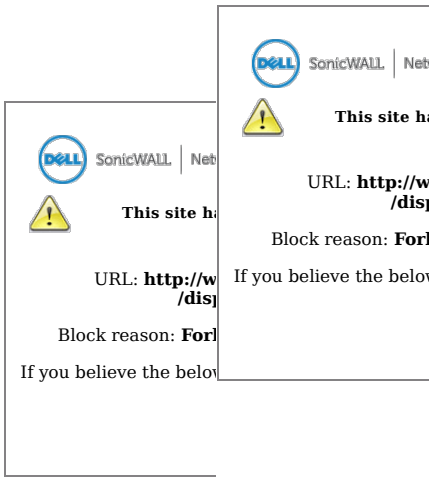

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