Efficient way to multiply with 7

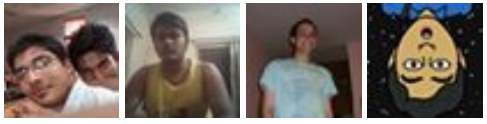
We can multiply a number by 7 using bitwise operator. First left shift the number by 3 bits (you will get 8n) then subtract the original numberfrom the shifted number and return the difference (8n – n).

Program:

```
# include<stdio.h>

int multiplyBySeven(unsigned int n)
{
    /* Note the inner bracket here. This is needed
       because precedence of '-' operator is higher
       than '<<' */
    return ((n<<3) - n);
}

/* Driver program to test above function */
int main()
{
    unsigned int n = 4;
    printf("%u", multiplyBySeven(n));

    getchar();
    return 0;
}
```

Time Complexity: O(1)
Space Complexity: O(1)

Note: Works only for positive integers.



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Same concept can be used for fast multiplication by 9 or other numbers.

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Nimish • 7 months ago

why not n+(n<<1)+(n<<2) ?
as bit shifts are still three only, though not don at once, but instead of one "-" w
using "+" can be more efficient than using "-" i guess.

1 ^ | v •

vindhya • 2 years ago

someone plz explain this..how does it give O(1) complexity??sorry i m weak a

```
/* Paste your code here (You may delete these lines if not writing co
```

^ | v •

vindhya ➚ vindhya • 2 years ago

oh..!!understood..:)

```
/* Paste your code here (You may delete these lines if not writ
```

^ | v •

frankc • 3 years ago

Is it possible to use divide and conquer and the "clever" multiplication algorithm
by 7 or 15?

/* Paste your code here (You may delete these lines if not writing co

705

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bala • 3 years ago

Sometimes ,we do have to take care of overflow even if multiplication by 7 or 1

nitesh.gami008 bala • 3 years ago

@bala....Please give some example....

adsf nitesh.gami008 • a year ago

Consider this binary number
0100 0000
how will you shift 3 times without handling overflow

Correct me if i am wrong

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