Rotate bits of a number

Bit Rotation: A rotation (or circular shift) is an operation similar to shift except that the bits that fall off at one end are put back to the other end.

In left rotation, the bits that fall off at left end are put back at right end.

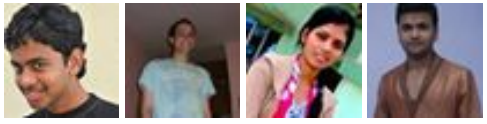
In right rotation, the bits that fall off at right end are put back at left end.

Example:
Let n is stored using 8 bits. Left rotation of n = 11100101 by 3 makes n = 00101111 (Left shifted by 3 and first 3 bits are put back in last). If n is stored using 16 bits or 32 bits then left rotation of n (000…11100101) becomes 00..00**11100101**000.
Right rotation of n = 11100101 by 3 makes n = 10111100 (Right shifted by 3 and last 3 bits are put back in first) if n is stored using 8 bits. If n is stored using 16 bits or 32 bits then right rotation of n (000…11100101) by 3 becomes **101**000..00**11100**.

```
#include<stdio.h>
#define INT_BITS 32

/*Function to left rotate n by d bits*/
int leftRotate(int n, unsigned int d)
{
   /* In n<<d, last d bits are 0. To put first 3 bits of n at
     last, do bitwise or of n<<d with n >>(INT_BITS - d) */
   return (n << d)|(n >> (INT_BITS - d));
}

/*Function to right rotate n by d bits*/
int rightRotate(int n, unsigned int d)
{
   /* In n>>d, first d bits are 0. To put last 3 bits of at
```

```
    first, do bitwise or of n>>d with n <<(INT_BITS - d) */
   return (n >> d)|(n << (INT_BITS - d));
}

/* Driver program to test above functions */
int main()
{
  int n = 16;
  int d = 2;
  printf("Left Rotation of %d by %d is ", n, d);
  printf("%d", leftRotate(n, d));
  printf("\nRight Rotation of %d by %d is ", n, d);
  printf("%d", rightRotate(n, d));
  getchar();
}
```

Please write comments if you find any bug in the above program or other ways to solve the same problem.

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Mahesh Devkar • 2 months ago
its awesome.....
Thank you.....:-)
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Haider Ali • 11 months ago
very good
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abhishek08aug • a year ago
Here is the simple approach. Pick a bit and put it in the end:

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


char * bit_representation(unsigned int num) {
```

```
  char * bit_string = (char *)malloc(sizeof(char)*sizeof(unsigned int
  unsigned int i=1, j;
  for(i=i<<(sizeof(unsigned int)*8-1), j=0; i>0; i=i>>1, j++) {
    if(num&i) {
      *(bit_string+j)='1';
    } else {
      *(bit_string+j)='0';
    }
  }
  *(bit_string+j)='&#92&#48';
  return bit_string;
}
```

see more

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abhishek08aug ➚ abhishek08aug • a year ago

Oops I just reversed the bits :-o

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gladiator ➚ abhishek08aug • 11 months ago

Intelligent :D

```
/* Paste your code here (You may delete these lines if
```

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Hanish • a year ago

It does not work for negative numbers. Because right shifting a negative numb
number

705

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number.
Type casting of n to unsigned int is required in the function argument

Satish • 2 years ago

```
#include
#include
#define value(a)8*sizeof(a)
void main()
{
int n=3;
int a=8;
char a1=8;
clrscr();

printf(" left rotates %d",(a<>value(a)-n));
printf("\n\n Right rotates %d",(a>>n)|(a<<value(a)-n));

printf("\n\ncharacter left rotates %d",(a1<>value(a1)-n));
printf("\n\ncharacter Right rotates %d",(a1>>n)|(a1<<value(a1)-n));

getch() ;

}
```

this program automatic adjust the no. of byte block...

vinay polisetti • 3 years ago

most elegant solution I have ever seen !!

abhishek • 3 years ago

This above approach works in following cases only:

This above approach works in following cases only.
1. unsigned integer
2. number to be rotated should occupy whole width of integer.

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Suresh Paldia • 3 years ago

```
#include<stdio.h>
void main()
{
        int x=67, y=35;
        int a,b;
        int result;
        a=x/y;
        b=y/x;
        result = (x*(a) + y*(b));
        result = result/(a+b);
        printf("Greater of %d and %d is %d",x,y,result);
}
```

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sunny321 • 4 years ago

what happen if num is -ve

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sunny ➚ sunny321 • 4 years ago

plzzzz reply my query also

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vaibhav • 4 years ago

this implementation has a problem.Take a number 27 (11011) and rotate it lef
here you van not always take no of bit= 32.You will try to find the position of lef

equal to that value.

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sureshpaldia22 vaibhav • 3 years ago

You can have a modification in definition of INT_BITS to get the bits cou

#define INT_BITS 8*sizeof(int)

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Krishna Kishore sureshpaldia22 • 2 years ago

```
 /*we can find the left most set bit as */
for ( int i = 0  ; n >> 1 ; i++ );
/* The value of i would be the position of Left Most set
```

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GeeksforGeeks vaibhav • 4 years ago

@vaibhav: The program doesn't return 15 for 27. We have added few r

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Silent GeeksforGeeks • 7 months ago

it does not work for negative numbers as negative numbers are

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