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$Q \rightarrow$

odd or even

$6q \rightarrow$ $5 \rightarrow$ 0 1 0 ⟨1⟩

if(n & 1)

else odd

even

$$\frac{\& 1}{1 \rightarrow odd}$$

$1 \rightarrow odd$

$0 \rightarrow even$

$4 \rightarrow$ 1 0 0

$$\frac{\& 1}{1 0 ⓪}$$

even

$5 \rightarrow$

$$\frac{\& 1}{1 \rightarrow odd}$$

$Q \rightarrow a, b$

$a = 11$, $b = 15$

$a = 1\overset{\scriptscriptstyle\leftarrow 0}{0}11$

$b = {}^{\wedge}1111$

_____

Binary $\quad 0\ |\ 00$

$\uparrow$

$\textcircled{1}$

min no. of $a \rightarrow b$

Set (1)

7:38 / 21:22

Count the no of set bits $\Rightarrow$

$$\text{count} \leftarrow 0$$

$$\text{while}(n > 0)$$

$$\text{count} = \text{count} + \Big\{ \qquad \text{count} += (n \& 1)$$

$$n = n \gg 1$$

$$\Big\} \quad \text{return count;}$$

$\text{count} = 0 + 1 + 0$

$+1 = ②$

$5 \rightarrow 1 0 \Big\}$

$\& 1$
___
1

$$\begin{array}{r} 0\,0\,1 \\ \& 1 \\ \hline ① \end{array}$$

$5 \gg 1$

$\leftarrow$ 0 1 0 1 Discard

$\begin{array}{r} 0\,1\,0 \\ \& 1 \\ \hline 0 \end{array}$

0 1 0

Bitmasking / Bitmanipulation 03- Questions on Bitmasking from hackerrank and GeeksForGeeks - YouTube - Mozilla Firefox

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https://www.youtube.com/watch?v=aId6iahUGLI&list=PLX0iyO9CrCF1-4je7G0JMSr

YouTube ^{IN}

bit manipulation for competitive programming

$Q \Rightarrow$ Playing with Bits $\Rightarrow$

$Eg \Rightarrow \quad a = 10, \quad b = 15 \quad a \longrightarrow b \text{ (inclusive)}$

$$a = 10 \Rightarrow 1010 - 2$$
$$11 \rightarrow 1011 - 3$$
$$12 \rightarrow 1100 - 2$$
$$13 \rightarrow 1101 - 3$$
$$14 \rightarrow 1110 - 3$$
$$b = 15 \rightarrow 1111 - 4$$
$$\underline{\quad\quad\quad}$$
$$17 \text{ (output)}$$

Bitmasking / Bitmanipulation for Competitive Prograr
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Unique Number 3
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```cpp
14  }
15  int main()
16  {
17      ios_base::sync_with_stdio(false);
18      cin.tie(NULL);  cout.tie(NULL);
19      ll test; cin >> test;
20      while(test--)
21      {
22          int a, b; cin >> a >> b;
23          int count = 0;
24          for (int i = a; i <= b; i++)
25          {
26              // Check if the no is even and is less than b
27              if ((i&1) == 0 && i < b)
28              {
29                  count += 2 * countSetBits(i) + 1;
30                  i++;
31                  continue;
32              }
33              count += countSetBits(i);
34          }
35          cout << count << '\n';
36      }
37      return 0;
38  }
```

$$\text{even}$$

$$\rightarrow 10 \rightarrow \quad 1 0 1 0 \rightarrow 2$$

$$\rightarrow 11 \rightarrow \quad 1 0 1 1$$

$$\text{odd}$$

$$2 * 2 + 1$$

$$4 + 1 = 5$$

$$10, 11, 12, 13, \boxed{14}$$

$$C^{10}_{11}$$

Eg → 1, 1, 2, 3 — Sequence

Unique

Approach → (new) → 1 ~ 1 ^ 2 ^ 3 = 2^3

$$1 \sim \frac{1}{0} - x$$

② → 10

③ → ^ 11

$$\frac{0\text{-th bit}}{0 \downarrow}$$

→ set bit (1)

x
1, 1, 2, 3

tempArr → 1, 1, 3

1 ^ 1 ^ 3 = ③

File   Edit   Selection   View   Go   Debug   Terminal   Help   uniqueNo2.cpp - C++ - Visual Studio Code

playingWithBits.cpp   maximizingXor.cpp   uniqueNo2.cpp ×

```cpp
6      int n;              ← size
7      cin >> n;
8      int *arr = new int[n];    ← dynamic array
9      int res = 0;
10     for (int i = 0; i < n; i++)
11     {                              } res = ^ of each no.
12         cin >> arr[i];    ←
13         res ^= arr[i];
14     }
15     int tempRes = res, index = 0;
16     // Check the first bit which is set(1)
17     while (tempRes > 0)
18     {
19         if (tempRes & 1)
20             break;
21         index++;
22         tempRes = tempRes >> 1;
23     }
24     int mask = (1 << index);
25     vector<int> tempArr;
26     for (int i = 0; i < n; i++)
27     {
28         if (arr[i] & mask)
29             tempArr.push_back(arr[i]);
30     }
31     int a = 0;
```

$$(tempRes \& 1) == \textcircled{1}$$

$$break;$$

$$ol\textcircled{0} \gg 1$$

$$001\boxed{0}$$

main()   Indents: 3   Ln 29, Col 39   Spaces: 4   UTF-8   CRLF   C++   Win32

19:04 / 23:10