

-ve?

12 \Rightarrow 0000 1100

1's comp \Rightarrow 1111 0011

2's comp \Rightarrow 1111 0100 $\Rightarrow -12$

10 \Rightarrow 0000 1010

1's \Rightarrow 1111 0101

2's \Rightarrow 1111 0110 $\Rightarrow -10$

$$\begin{array}{r} -10 \\ + -12 \\ \hline -22 \end{array}$$

$$3 + 3 = 6$$

100000-000

$2^{31} - 1$ Max Min -2^{31}
 2147483647 -2147483648

$$\begin{array}{r} 01111111111111111111111111111111 \\ + \quad 100 \dots \dots \dots 000 \\ \hline \end{array}$$

int $\rightarrow 31^{st}$ $2^{31} - 1$
long $\rightarrow 63^{rd}$ $2^{63} - 1$

31

long

$$\begin{aligned} 1^0 &= 1 \\ 0^1 &= 1 \\ 1^1 &= 0 \\ 0^0 &= 0 \end{aligned}$$

$$\begin{array}{r} 001 \\ 100 \\ \hline 101 \end{array} \Rightarrow 2$$

$$\begin{aligned} 0 \wedge 1 &\Rightarrow 1 \\ 1 \wedge 1 &\Rightarrow 0 \end{aligned}$$

$$\begin{array}{r} 010110 \\ \wedge \quad 111111 \\ \hline 101001 \end{array}$$

$\{1, 2, 3, 10, 4, 6, 12\}$

Subset	Subseq	Subarr
ϕ	ϕ	—
$\{10, 2\}$	$\{2, 10\}$	$\{2, 3, 10, 7\}$
$\{2, 10\}$		
$\{2, 3, 10, 7\}$		

$$3^4 (3^4 4)^4 (3^4 4^4 6)^4 (3^4 4^4 6^4 2^4)^4 4^4 (4^4 6)^4 (4^4 6^4 2^4)^4 6^4 (6^4 2^4)^4 (2^4)$$

Handwritten notes on the output: $6^2 + 5^2 + 4^2 + 3^2 + 2^2 + 1^2 = 91$

```

#include <iostream>
using namespace std;

int main()
{
    int n;
    cout << "Enter a number: ";
    cin >> n;

    int sum = 0;
    for (int i = 1; i <= n; i++)
    {
        sum = sum + i*i;
    }

    cout << "Sum of squares of first " << n << " natural numbers is: " << sum << endl;

    return 0;
}

```

Output:

```

Enter a number: 6
Sum of squares of first 6 natural numbers is: 91

```

10, 20, 30

0	0	0	0	$\Rightarrow \{ \}$
1	0	0	1	$\Rightarrow \{10\}$
2	0	0	1	$\Rightarrow \{20\}$
3	0	1	1	$\Rightarrow \{10, 20\}$
4	1	0	0	$\Rightarrow \{30\}$
5	1	0	1	$\Rightarrow \{10, 30\}$
6	1	1	0	$\Rightarrow \{20, 30\}$
7	1	1	1	$\Rightarrow \{10, 20, 30\}$

$m=1$

(2^3)