Power of 2 in C++

```
#include <iostream>
using namespace std;

void powerOf2(int x) {
    if ((x & (x - 1)) == 0) {
        cout << x << " is Power of two" <<
endl;
    } else {
        cout << x << " is not Power of two"
<< endl;
    }
}

int main() {
    int x = 9;
    for (int i = 1; i <= 32; i++) {
        powerOf2(i);
    }

    return 0;
}
```

Key Logic:

if ((x & (x - 1)) == 0)

This works because:

- A power of two has only **one set bit** in binary.
- x & (x - 1) turns off the lowest set bit, so:
    - If result is 0 → x was a power of 2.
    - Otherwise → it's not.

🔢 Dry Run Table (for x from 1 to 16 for brevity):

x	Binary of x	x-1	Binary of x-1	x & (x-1)	Is Power of 2?
1	00000001	0	00000000	00000000	✅ Yes
2	00000010	1	00000001	00000000	✅ Yes
3	00000011	2	00000010	00000010	❌ No
4	00000100	3	00000011	00000000	✅ Yes
5	00000101	4	00000100	00000100	❌ No
6	00000110	5	00000101	00000100	❌ No
7	00000111	6	00000110	00000110	❌ No
8	00001000	7	00000111	00000000	✅ Yes
9	00001001	8	00001000	00001000	❌ No
10	00001010	9	00001001	00001000	❌ No
11	00001011	10	00001010	00001010	❌ No
12	00001100	11	00001011	00001000	❌ No
13	00001101	12	00001100	00001100	❌ No
14	00001110	13	00001101	00001100	❌ No
15	00001111	14	00001110	00001110	❌ No
16	00010000	15	00001111	00000000	✅ Yes

✅ Output for i = 1 to 32:

The function will print:

1 is Power of two
2 is Power of two
3 is not Power of two
4 is Power of two
5 is not Power of two
...
32 is Power of two

Output:-
1 is Power of two

2 is Power of two
3 is not Power of two
4 is Power of two
5 is not Power of two
6 is not Power of two
7 is not Power of two
8 is Power of two
9 is not Power of two
10 is not Power of two
11 is not Power of two
12 is not Power of two
13 is not Power of two
14 is not Power of two
15 is not Power of two
16 is Power of two
17 is not Power of two
18 is not Power of two
19 is not Power of two
20 is not Power of two
21 is not Power of two
22 is not Power of two
23 is not Power of two
24 is not Power of two
25 is not Power of two
26 is not Power of two
27 is not Power of two
28 is not Power of two
29 is not Power of two
30 is not Power of two
31 is not Power of two
32 is Power of two