

```
1  /*
2  Create a program to demonstrate &, |, ^, ~, <<, >> operations with program
   examples.
3  Show how to extract the nth bit from a number.
4  */
5
6  #include <iostream>
7
8  using namespace std;
9
10 int main() {
11     int a = 5, b = 3; // Binary: 5 = 0101, 3 = 0011
12
13     // Bitwise AND
14     cout << "a & b = " << (a & b) << endl;
15
16     // Bitwise OR
17     cout << "a | b = " << (a | b) << endl;
18
19     // Bitwise XOR
20     cout << "a ^ b = " << (a ^ b) << endl;
21
22     // Bitwise NOT (1's complement)
23     cout << "~a = " << (~a) << endl;
24
25     // Left Shift
26     cout << "a << 1 = " << (a << 1) << endl;
27
28     // Right Shift
29     cout << "a >> 1 = " << (a >> 1) << endl;
30
31     int n = 2;
32     int bit = (a >> n) & 1;
33     cout << "The " << n << "nd bit of " << a << " is: " << bit << endl;
34
35     return 0;
36 }
37
```