Binary numbers – Exercises

Task 1. Get bit at index. (Problem B from Contest 6)

You are given an integer number A and an index i. Find and print the bit at position i in the number. The least significant bits have the lower indices.

Example input:
9 1

Example output:
0

Task 2. Number of ones. (Problem D from Contest 6)

You are given an integer number A in the range 0 <= A <= 4*1018. Print the number of bits set to 1 in the binary representation of A.

Example input:
9

Example output:
2

Example input:
126

Example output:
6

Task 3. Output Binary Number. (Not from Contest 6)

Write a function that takes an unsigned integer number, and converts the number into a binary number. Use std::vector<char> to store the binary number.

Overload the standard output operator << for std::vector<char>
to print the binary number in «32-bits format» (including leading zeros). Separate groups of 4 bits with apostrophes (').

Example input:
5

Example output:
0000'0000'0000'0000'0000'0000'0000'0101