
n-bit adder**X84292_en**

Design a circuit that performs the addition of two n -bit numbers. The result must be represented in n bits also. The number of bits n must be a parameter of the module.

Specification

```
module adder (a, b, cin, sum, cout);
  parameter N=16;
  input [N-1:0] a, b;
  input cin;
  output [N-1:0] sum;
  output cout;
```

Hint

You may want to use several instances of a 1-bit full adder.

Input

- a and b are the two n -bit numbers.
- cin is the input carry.

Output

- sum is the n -bit output representing $(a + b) \bmod 2^n$.
- $cout$ is the output carry.

Problem information

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