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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Generation : 2013-09-02 15:58:42