## *n*-bit comparator X37457_en

Design a circuit that compares two $n$-bit numbers represented in binary code and indicates whether the first is greater than, equal to or smaller than the second.
The number of bits of the numbers must be a parameter of the module with a default value as shown in the specification.

### Specification

**module** *cmp*(*a*, *b*, *eq*, *gt*, *lt*);
  **parameter** *N*=16;
  **input** [*N*−1:0] *a*, *b*;
  **output** *eq*, *gt*, *lt*;

### Hint

Design a 1-bit comparator that receives the result of the comparison of the least-significant bits. Use $n$ instances of this circuit.

### Input

- $a$ and $b$ are the two $n$-bit input numbers.

### Output

- $eq$ indicates that $a=b$.
- $gt$ indicates that $a>b$.
- $lt$ indicates that $a<b$.

### Problem information

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