

Module add ○

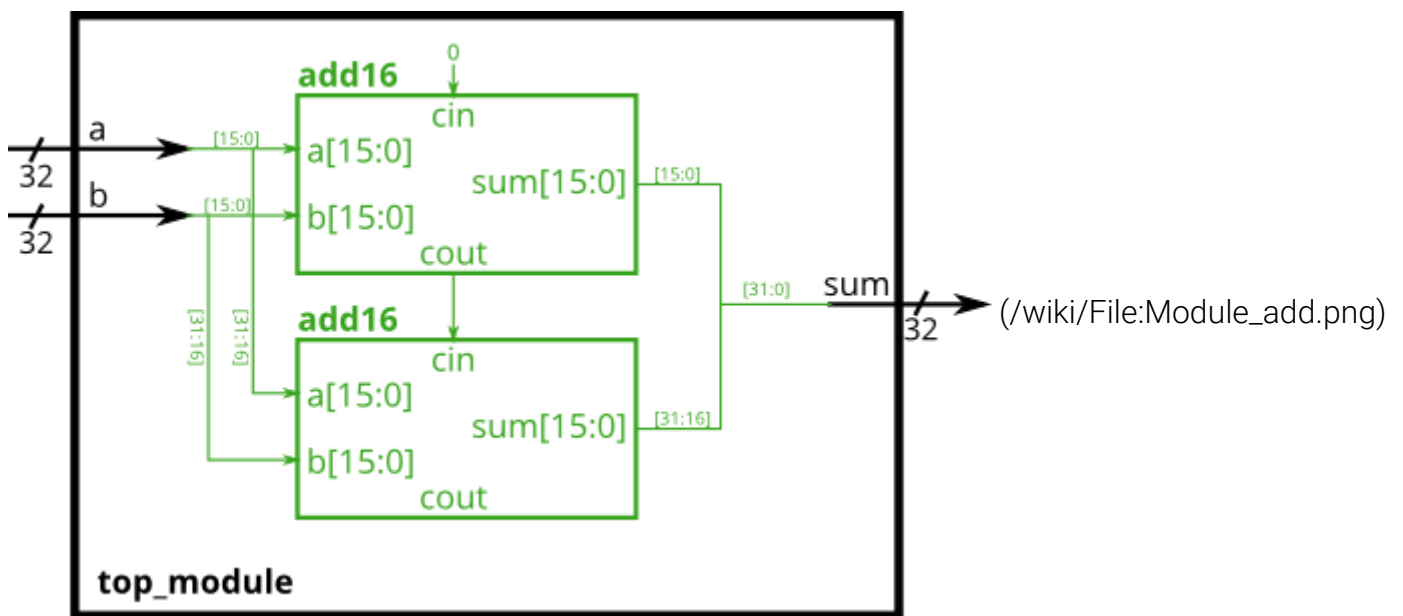
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You are given a module `add16` that performs a 16-bit addition. Instantiate two of them to create a 32-bit adder. One `add16` module computes the lower 16 bits of the addition result, while the second `add16` module computes the upper 16 bits of the result, after receiving the carry-out from the first adder. Your 32-bit adder does not need to handle carry-in (assume 0) or carry-out (ignored), but the internal modules need to in order to function correctly. (In other words, the `add16` module performs 16-bit $a + b + \text{cin}$, while your module performs 32-bit $a + b$).

Connect the modules together as shown in the diagram below. The provided module `add16` has the following declaration:

```
module add16 ( input[15:0] a, input[15:0] b, input cin, output[15:0]
sum, output cout );
```



Module Declaration

```
module top_module(
    input [31:0] a,
    input [31:0] b,
    output [31:0] sum
);
```

Write your solution here

```
1 module top_module(
2     input [31:0] a,
```

```


3   input [31:0] b,
4   output [31:0] sum
5 );
6
7 endmodule
8

```

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