perplexity

We are generating a 64-to-1 multiplexer hierarchically in Verilog. We have generated 2-to-1 multiplexer defined as follows:

module mux2_1(
input in1,
input in2,
input select,
output out
);

```
assign out = select ? in2 : in1;
```

endmodule

Please include the previous module(s) in your response and use them to hierarchically generate a 4-to-1 multiplexer defined as:
module mux4_1(in[3:0], select, out);
//Insert code here
endmodule

```
module mux2_1(
    input  in1,
    input  in2,
    input  select,
    output out
);

    assign out = select ? in2 : in1;

endmodule

module mux4_1(
    input [3:0] in,
    input [1:0] select,
    output out
);

    wire out1, out2;

    mux2_1 mux1 (
        .in1(in[0]),
        .in2(in[1]),
```

```
        .select(select[0]),
        .out(out1)
    );

    mux2_1 mux2 (
        .in1(in[2]),
        .in2(in[3]),
        .select(select[0]),
        .out(out2)
    );

    mux2_1 mux3 (
        .in1(out1),
        .in2(out2),
        .select(select[1]),
        .out(out)
    );

endmodule
```