```
1    module OscillatorX2 (
2        input clk,
3        input [7:0] x,
4        output reg [7:0] f
5    );
6        reg [2:0]q = 3'b010;
7
8        always @(posedge clk) begin
9            if (q == 2) begin
10               q <= 0;
11               f <= x;
12           end
13           else begin
14               q <= q + 1;
15               f <= f + 1;
16           end
17
18       end
19
20   endmodule
```