

"گزارش پروژه اول"

هایپرکیوب- فاطمه منصوری - آراس ولی زاده

گزارش:

همانطور که در کد به زبان وریلاگ مشاهده میشود برای سورت دو مکعب ابتدا عناصر متناظر در دو مکعب را مقایسه میکنیم. سپس عناصر هر مکعب را ابتدا در راستای ایگرگ، سپس ایکس و در نهایت با عنصر در راستای کا مقایسه میکنیم.

```
1 module main (  
2     input clk,  
3     input [15:0] input0 ,  
4     input [15:0] input1 ,  
5     input [15:0] input2 ,  
6     input [15:0] input3 ,  
7     input [15:0] input4 ,  
8     input [15:0] input5 ,  
9     input [15:0] input6 ,  
10    input [15:0] input7 ,  
11    input [15:0] input8 ,  
12    input [15:0] input9 ,  
13    input [15:0] input10 ,  
14    input [15:0] input11 ,  
15    input [15:0] input12 ,  
16    input [15:0] input13 ,  
17    input [15:0] input14 ,  
18    input [15:0] input15  
19 );
```

```

1  reg [31:0] outputNodes [15:0];
2  reg [31:0] first_input [15:0];
3  reg [31:0] temp;
4  always @(posedge clk) begin
5      outputNodes[0] = input0;
6      first_input[0] = input0;
7      outputNodes[1] = input1;
8      first_input[1] = input1;
9      outputNodes[2] = input2;
10     first_input[2] = input2;
11     outputNodes[3] = input3;
12     first_input[3] = input3;
13     outputNodes[4] = input4;
14     first_input[4] = input4;
15     outputNodes[5] = input5;
16     first_input[5] = input5;
17     outputNodes[6] = input6;
18     first_input[6] = input6;
19     outputNodes[7] = input7;
20     first_input[7] = input7;
21     outputNodes[8] = input8;
22     first_input[8] = input8;
23     outputNodes[9] = input9;
24     first_input[9] = input9;
25     outputNodes[10] = input10;
26     first_input[10] = input10;
27     outputNodes[11] = input11;
28     first_input[11] = input11;
29     outputNodes[12] = input12;
30     first_input[12] = input12;
31     outputNodes[13] = input13;
32     first_input[13] = input13;
33     outputNodes[14] = input14;
34     first_input[14] = input14;
35     outputNodes[15] = input15;
36     first_input[15] = input15;
37     for (integer b = 16; b > 1; b = b / 2) begin
38         for (integer i = 0; i < 16; i = i + b) begin
39             for (integer j = i; j < i + b / 2; j = j
+ 1) begin
40                 if (outputNodes[j] > outputNodes[j +
b / 2]) begin
41                     temp = outputNodes[j];
42                     outputNodes[j] = outputNodes[j +
b / 2];
43                     outputNodes[j + b / 2] = temp;
44                 end
45             end
46         end
47     end
48     $display("id: 1 first:%d sorted:%d",first_input[0
], outputNodes[0]);
49     $display("id: 2 first:%d sorted:%d",first_input[1
], outputNodes[1]);
50     $display("id: 3 first:%d sorted:%d",first_input[2
], outputNodes[2]);
51     $display("id: 4 first:%d sorted:%d",first_input[3
], outputNodes[3]);
52     $display("id: 5 first:%d sorted:%d",first_input[4
], outputNodes[4]);
53     $display("id: 6 first:%d sorted:%d",first_input[5
], outputNodes[5]);
54     $display("id: 7 first:%d sorted:%d",first_input[6
], outputNodes[6]);
55     $display("id: 8 first:%d sorted:%d",first_input[7
], outputNodes[7]);
56     $display("id: 9 first:%d sorted:%d",first_input[8
], outputNodes[8]);
57     $display("id: 10 first:%d sorted:%d",first_input[
9], outputNodes[9]);
58     $display("id: 11 first:%d sorted:%d",first_input[
10], outputNodes[10]);
59     $display("id: 12 first:%d sorted:%d",first_input[
11], outputNodes[11]);
60     $display("id: 13 first:%d sorted:%d",first_input[
12], outputNodes[12]);
61     $display("id: 14 first:%d sorted:%d",first_input[
13], outputNodes[13]);
62     $display("id: 15 first:%d sorted:%d",first_input[
14], outputNodes[14]);
63     $display("id: 16 first:%d sorted:%d",first_input[
15], outputNodes[15]);
64     end
65
66 endmodule

```

```
1      main cube_sort (  
2          clk,  
3          wire0  
4      ,      wire1  
5      ,      wire2 ,  
6          wire3 ,  
7          wire4 ,  
8          wire5 ,  
9          wire6 ,  
10         wire7 ,  
11         wire8 ,  
12         wire9 ,  
13         wire10  
14     ,      wire11  
15     ,      wire12  
16     ,      wire13  
17     ,      wire14  
18     ,      wire15  
19 );  
20     initial begin  
21         clk = 1;  
22         wire0 = 'd3;  
23         wire1 = 'd5;  
24         wire2 = 'd8;  
25         wire3 = 'd9;  
26         wire4 = 'd10;  
27         wire5 = 'd12;  
28         wire6 = 'd14;  
29         wire7 = 'd20;  
30         wire8 = 'd95;  
31         wire9 = 'd90;  
32         wire10 = 'd60;  
33         wire11 = 'd40;  
34         wire12 = 'd35;  
35         wire13 = 'd32;  
36         wire14 = 'd18;  
37         wire15 = 'd0;  
38     end  
39 endmodule
```

```
nodeNumber: 1 first:      3 sorted:      0
nodeNumber: 2 first:      5 sorted:      3
nodeNumber: 3 first:      8 sorted:      5
nodeNumber: 4 first:      9 sorted:      8
nodeNumber: 5 first:     10 sorted:      9
nodeNumber: 6 first:     12 sorted:     10
nodeNumber: 7 first:     14 sorted:     12
nodeNumber: 8 first:     20 sorted:     14
nodeNumber: 9 first:     95 sorted:     18
nodeNumber: 10 first:     90 sorted:     20
nodeNumber: 11 first:     60 sorted:     32
nodeNumber: 12 first:     40 sorted:     35
nodeNumber: 13 first:     35 sorted:     40
nodeNumber: 14 first:     32 sorted:     60
nodeNumber: 15 first:     18 sorted:     90
nodeNumber: 16 first:      0 sorted:     95
```