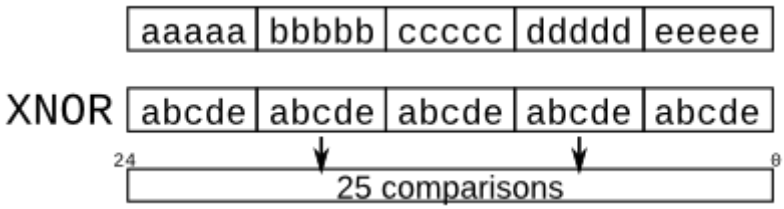
Vector5

vector4 (/wiki/vector4)

module (/wiki/module)

Given five 1-bit signals (a, b, c, d, and e), compute all 25 pairwise one-bit comparisons in the 25-bit output vector. The output should be 1 if the two bits being compared are equal.

```
out[24] = ~a ^ a;   // a == a, so out[24] is always 1.
out[23] = ~a ^ b;
out[22] = ~a ^ c;
...
out[ 1] = ~e ^ d;
out[ 0] = ~e ^ e;
```



(/wiki/File:Vector5.png)

As the diagram shows, this can be done more easily using the replication (/wiki/Vector4) and concatenation operators.

- The top vector is a concatenation of 5 repeats of each input
- The bottom vector is 5 repeats of a concatenation of the 5 inputs

Module Declaration

```
module top_module (
    input a, b, c, d, e,
    output [24:0] out );
```

Write your solution here

```
1  module top_module (
2      input a, b, c, d, e,
3      output [24:0] out );//
4
5      // The output is XNOR of two vectors created by
6      // concatenating and replicating the five inputs.
7      // assign out = ~{ ... } ^ { ... };
8
9  endmodule
10
```

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Solution

Complete problem first to see solution

vector4 (/wiki/vector4)

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Problem Set Contents