Computer Organization

Lecture - 5 -

Computer Science Dept.

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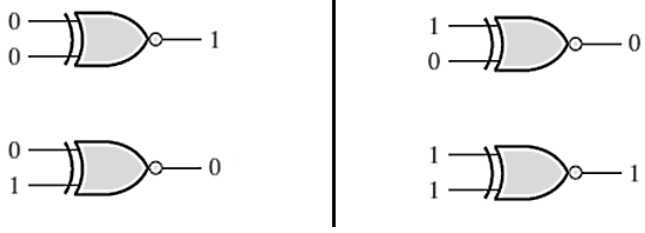
The ALU

❖ **Comparators**

The basic function of a **comparator** is to compare of two binary quantities. In its simplest form, a comparator circuit determines whether two numbers are equal.

The X-NOR gate can be used as a basic comparator because its output is a 0 if the two input bits are not equal and a 1 if the input bits are equal.



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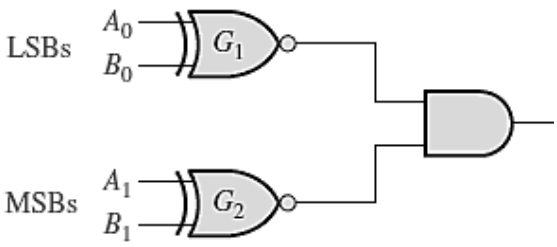
In order to compare binary numbers containing **two bits** each, an additional X-NOR gate is necessary. The two least significant bits (LSBs) of the two numbers are compared by gate *G*1, and the two most significant bits (MSBs) are compare by gate *G*2.



The ALU

Example: Apply each of the following sets of binary numbers to the comparator inputs, and determine the output.

(a) 10 and 10 **(b)** 11 and 10

Solution: