Number of factors

CP220 Project Phase I

Lubna Al Rifaie

200821590

Fall 2021

Description:

The factors will be recognised by this circuit. It would be somewhere between zero and fifteen. When a number is a factor of another number, it means that the first number must completely divide the second number without leaving any residue. To put it another way, if a number If any number (divisor) is exactly divisible by (dividend), then the divisor is a factor of that number. dividend. Each number has a common factor, which is one, as well as the number itself. So generally, this circuit will take binary numbers as inputs and produce binary numbers as outputs such as the number of elements that the input number has in form, including one and itself of binary digits.

Objective:

The goal of the Number of Factors project is to build a circuit that takes four binary inputs and outputs three values, giving the binary value of the factored number. If the input is 6, for example, the output should be 4 because the factors of 6 are 1,2,3, and 6.

Process of the circuit:

The Number of Factor circuit will take a binary number as an input through I1, I2, I3, and I4, convert it to decimal, and then divide the decimal input by all the numbers starting with 1 and ending with the input number itself. Any integers that divide the input evenly will be searched for by the circuit. When the circuit encounters such a number, it keeps track of all the numbers that are evenly divided by the input. When the circuit has reached the point where it has divided the input by itself, it will transform the result into a binary number and output the binary numbers through O1, O2, and O3.

Input:

The binary value would be the input, and the number of inputs would be four. The input would be in the form of a0 to a3, with a0 being the binary representation of a number and a3 being the binary representation of a number.

Output:

The output would be a binary value for the number of components that the input number has, including one and itself. There would be three outputs. The output would be in the form of d0 to d2, which represents a number in binary form.

Error Condition:

Some problems that we might encounter during the progress of completing the circuit will be Decimal to Binary and figuring out how to divide using the circuit. As a group, we need to focus and figure out a solution to these problems before we start building the finial project. For Ambiguous possibilities, have been eliminated we believe we don't have any of now or doesn't exist.

Ambiguous possibilities:

None

PC/CP220 Project Phase I Checklist (3.01)

A. General

1. Professionally presented
   Neat, etc. _____

2. Properly identified
   (eg. name, id) _____

3. On time
   at *beginning* of lab *with checklist* _____

4. Good grammar
   (eg. complete sentences where required) _____

5. Correct spelling
   _____

B. Content

1. *Sufficient background*
   (ie. problem circuit is to solve) _____

2. *Inputs are specified*
   (eg. A_0,A_1,A_2,A_3 - binary) _____

3. *Outputs are specified*
   (eg. L_1,S_1,L_2,S_2, etc. - dashes/dots) _____

4. *Error conditions and responses*
   to them are specified
   (or stated that none exist) _____

5. *Ambiguous possibilities have been*
   eliminated (ie. don't care conditions)
   (or stated that none exist) _____