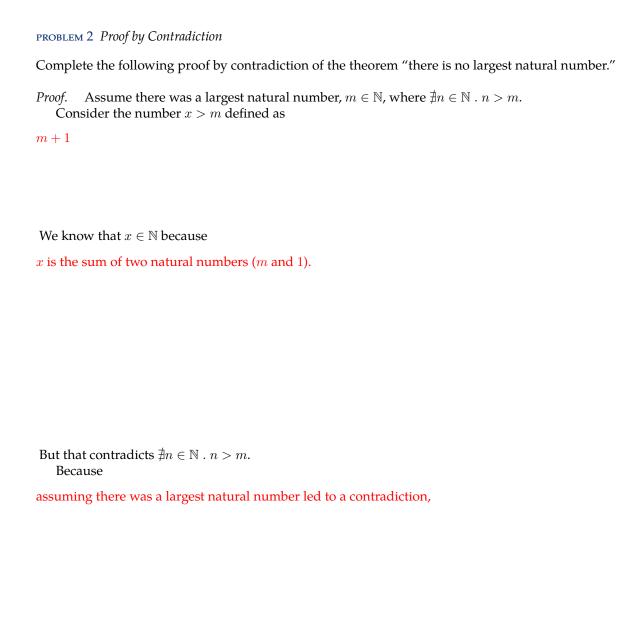
Name:	CompID:
CS 2102 - DMT1 - Fall 2019 — Luther Tychonievich Administered in class friday october 18, 2019	Quiz 06
This quiz refers to the following two definitions. The first we've see	en before:
<b>Definition 1 (Natural Number)</b> The number 0 is a natural number. The two natural numbers, $x$ and $y$ , their sum $x + y$ is also a natural number. The	
The second is often left undefined, relying on an intuitive sense of having a few rules might help:	what it means to be finite. However,
<b>Definition 2 (Finite)</b> Any integer you can write (and finish writing) in bas finite numbers is finite. Any number whose absolute value is smaller than so	
PROBLEM 1 Proof by Induction	
Complete the following proof by induction of the theorem "every natu	ural number is finite."
<i>Proof.</i> We use induction. The induction hypothesis is that a number is finite.	
Base case: 0 is finite, because	
it can be written using digits (i.e., "0").	
<b>Inductive step</b> : Assume that some $\underline{n \in \mathbb{N}}$ is fi must be finite because	nite. Then $n+1$
n+1 is the sum of two finite numbers: $n$ is finite by the inductive hypbe written using digits (i.e., "1").	pothesis, and $\boldsymbol{1}$ is finite because it can

It follows by induction that all natural numbers are finite.  $\hfill\Box$ 



there is no largest natural number.  $\Box$