History of Zero and One
Topic Paper #1

Alex Laird
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Computer Science, (319) 360-8771
alexdlaird@cedarville.edu

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ABSTRACT
This paper discusses the history and origins of zero and one, the two digits that solely make up the Binary Numeral System (BNS), the communication system that is the basis for all computing.

Keywords
History, Zero, One, Binary

1. INTRODUCTION
The concepts of numbers and their inadvertent uses have been around for all of time, but the definitions and mathematical uses had to be discovered and tested before making themselves readily understandable to cultures.

2. HISTORY OF ZERO
The Roman and Greek empires, which are so esteemed in our culture today for their geometric and mathematical intellect, used only the most primitive numbering systems. It wasn't until the 6th Century C.E., presumably somewhere in India, that it began to be gradually understood that a number should actually represent the existence of nothingness, or emptiness,, just like one or two. The absence of everything is just as much a counting piece or placeholder as any other number in the numbering system [2].

Without having a knowledge of the concept of zero from our prime, as we are in our advanced cultures today, the idea of nothing being defined as a number is actually quite complicated and, at the same time, extraordinarily revolutionary. The number zero isn't as intuitive as one would think [3]. Zero is both a number representing something and, at the same time, nothing; quite a paradox. Without zero, you could not specify the nonexistence of a quantity. Without zero, you could not specify that the year is 2011; what would go in the tens and hundreds place to illustrate that they are empty? For these reasons, and many others, the Babylonians first empty spaces, which lead to quite a bit of confusion, and eventually placed two wedges side-by-side to represent an empty space (2"11).

3. HISTORY OF ONE
The number one is a much simpler comment. One is the simplest unit in all numbering systems [4]. Tallying, the system based upon counting items, is based solely on incrementing by one. In fact, all numbering systems are based upon counting using ones in some form. One has always existed out of principle, because when you have a single item, you have one of that item. It is physically represented. When you have two, you have a set of ones. When you have three, you have a one, a one, and a one. This continues, and multiplication, division, and other forms of computation still come back to add or removing multiples ones from the equation.

4. ZERO AND ONE IN COMPUTING
Binary is the basis for all computing. Due to its two states, zero or one, it is used in Boolean systems to represent a true (on) or false (off) state. Digital circuitry is constructed using Boolean logic. The binary system is the lowest level language that communicates directly with the circuitry. Above it is machine and programming languages at a higher level that are more easily manipulated. High-level languages such as Java, C, or VisualBasic communicate indirectly with the binary language and are what programmers use to write desktop applications [1].

5. CONCLUSIONS
Zeros and ones and specifically the binary language are the basis for all computing. Computing is a fundamental part of the lives of everyone (if not directly then indirectly) in the world, and it is astonishing to think that at the core of a computer, a machine that can compute millions of processes in a single second, is two states: on and off, true and false, one and zero.

6. REFERENCES
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Alex Laird, Cedarville University, Cedarville, Ohio, 45314