



CS/IT 429

Number System

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Introduction

What is

Numeral/Number System....?

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Introduction

Number System

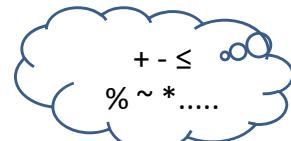
Number System

Mathematics is all about....

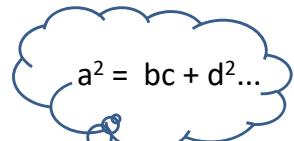
Symbols



Operators



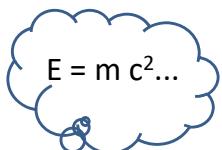
Equations



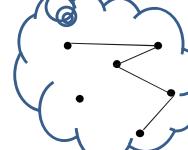
Shapes



Formulae



Algorithm



And many more...

Introduction

Any idea how Early human used numbers for counting....



Some Common Numeral/Number Systems

- Unary Numeral Systems
- Egyptian, Roman, Chinese Numeral system
- Number system according to English, French Language
- Hindu-Arabic System
- Positional System or Position Value notation

And many more....

Classification of Number System

- Natural Numbers
- Whole Numbers
- Integer
- Rational and Irrational
- Real Numbers

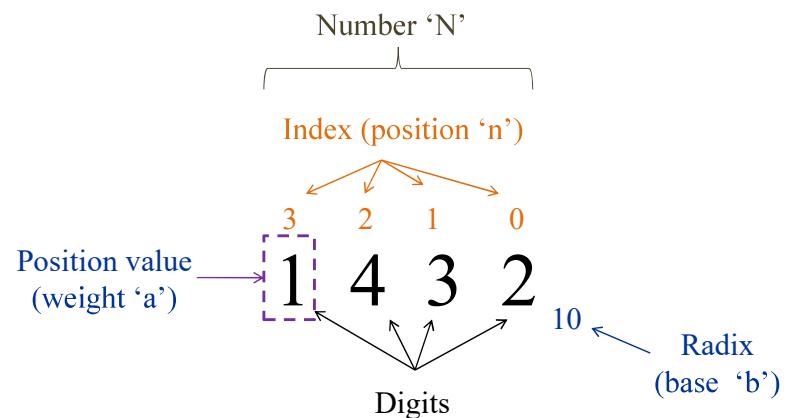
And so on....

Evolvement of Different Number Systems Across the World

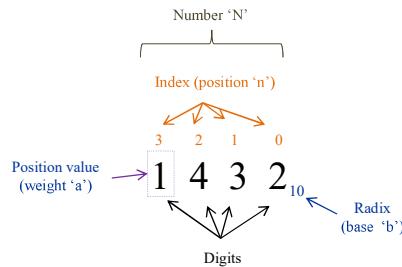


Positional Number System

Any number 'N' (say 1432) using positional notation can be defined as:



The number 'N' (integers) can be mathematically represented as:



Generalized formulae

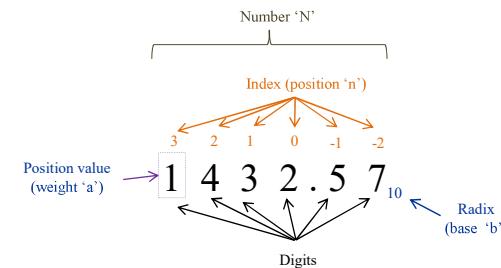
$$N(b) = \{ a_{n-1} b^{n-1} + a_{n-2} b^{n-2} + \dots + a_1 b^1 + a_0 b^0 \}$$



$$N(b) = a_{n-1} a_{n-2} \dots a_1 a_0 \dots a_{-n}$$

Depending on the Radix (base),
different Number systems
corresponding to Positional Notation
are defined

The number 'N' (fractional) can be mathematically represented as:



Generalized formulae

$$N(b) = \{ a_{n-1} b^{n-1} + a_{n-2} b^{n-2} + \dots + a_1 b^1 + a_0 b^0 + a_{-1} b^{-1} + a_{-2} b^{-2} \}$$



$$N(b) = a_{n-1} a_{n-2} \dots a_1 a_0 a_{-1} a_{-2}$$

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