CSE596 First Lecture Monday 8/26/19

Which came first: Number or Symbol?

eg:
$$\begin{array}{r} {}^{1}1^{1}87 \\ +\,236 \\ \hline 423 \end{array}$$

Numerical Actors:

Integers n, m, l, k, i, j ...

Each integer is Represented by a string over DIG. (or BIN)

Then sets of numbers, eg.

PRIMES = {2, 3, 5, 7, 11, ...}

correspond to languages

Both views of languages correspond to decision problems such as:

Given $X \in \mathbb{Z}$, is X prime?

Main Actors: Symbolic

1. Alphabet = a finite set of characters

Examples:

DIG = {0, 1, 2, 3, 4, 5, 6, 7, 8, 9}

BIN = {0, 1} The name Σ will often default to {0, 1} [Sigma]

A-Z = {A, ..., Z}

ASCII = 128 char codes for typewriter + control ops (later padded with 128 more)

UNICODE } UTF-8

16-bit chars (or more)

2. A string is a (finite) list of chars
eg x = "aaaab" length |x| = 5.

3. A language is a set of strings often infinite

4. A class is a set of languages. eg. Polynomial time.