Your Title Here

Owen Reilly

September 1, 2024

Hello, this is a simple LaTeX document.
1.

$$\Sigma^* = \left\{ x \mid \frac{x}{2} \in \mathbb{Z} \right\}$$

- An *Undirected Graph* G is a set of *vertices* V and *edges* $E \subseteq V \times V$ such that E is a symmetric relation.
- A *Binary Relation* is a yes or no association to pairs of elements. Formally, $R \subseteq S \times S$.
  - A *Reflexive Relation* is a relation R such that $(a, a) \in R$ for all $a \in S$.
  - A *Symmetric Relation* is a relation R such that if $(a, b) \in R$ then $(b, a) \in R$ for all $a, b \in S$.
  - A *Transitive Relation* is a relation R such that if $(a, b) \in R$ and $(b, c) \in R$, then $(a, c) \in R$ for all $a, b, c \in S$.
  - An *Equivalence Relation* is a relation that is reflexive, symmetric, and transitive.

Strings and Languages:

- An *Alphabet* is a finite set of symbols denoted by Σ.
  - Since an alphabet is finite, it is essentially just a set of symbols.
- A *String* is a finite sequence of symbols from an alphabet Σ.
  - String operations include concatenation, reversal, and legnth, ordering.
- A *Language* over an alphabet Σ is a set of strings of letters from Σ.
  - A language can be infinite.

$$\{0^i 1^j 2^k \mid 0 \leq i \leq j \leq k\}$$