

Languages and Grammars

Lecture 3 Section 1.2

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Outline

- 1 Languages
- 2 Grammars
- 3 Assignment

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Terminology

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- A **string** is a sequence of symbols.
- A **language** is a set of strings.

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- A **language** is a set of strings.
- Every language we consider will involve a *finite* alphabet and the strings will be *finite*.

Languages

- We let Σ represent the alphabet.
- Then Σ^* represents the set of all finite strings over Σ .

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Definition (Grammar)

A **grammar** is a quadruple $\{V, T, S, P\}$ where

- V is a finite set of **variables**,
- T is a finite set of **terminals**,
- $S \in V$ is the **start symbol**, and
- P is a set of **productions** of the form

$$X \rightarrow w,$$

where $X \in V$ and $w \in (V \cup T)^*$.

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- Section 1.2 Exercises 1, 4 (use 3), 5, 8, 12, 14ab, 15, 17abef, 23, 24.