

Lecture #10: Introduction to Turing Machines

What Will Happen During the Lecture

Review

The lecture presentation will begin with a ***brief*** review of the material in the preparatory video and documents for this lecture — and students will have the chance to ask questions about this.

Continuing the First Example

The first example of a Turing machine, from the preparatory material, will be considered once again, and a ***proof*** will be sketched that this Turing machine ***decides*** the language

$$\begin{aligned} L &= \{\omega \in \{a, b\}^* \mid |\omega| \geq 1 \text{ and } \omega \text{ begins, and ends, with the same letter}\} \\ &= \{a, b\} \cup \{a\mu a \mid \mu \in \{a, b\}^*\} \cup \{b\mu b \mid \mu \in \{a, b\}^*\}. \end{aligned}$$

Turing Machines That Compute Functions

Turing machines that compute functions (from the set of strings over one alphabet to the set of strings over another, possibly different, alphabet), will be introduced.