

Lecture #11: Simulations and Simple Turing Machine Variants

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.

Another Variant — Turing Machines with Two-Way Infinite Tapes

A ***Turing machine with a two-way infinite tape*** is similar to an ordinary Turing machine, but its tape is infinite to the left as well as to the right. The tape is initially filled with blanks except for the portion that contains the input — and the tape head is initially pointing to the leftmost symbol in the input if the input is nonempty. Computation is as usual, except that the tape head never encounters an end of the tape as it moves left.

During the lecture presentation, ***simulations*** will be used to show that the sets of *recognizable* and *decidable* languages would not be changed if they were defined using Turing machines with two-way infinite tapes, instead of the kind of Turing machines that was introduced in Lecture #10.