

# Lecture #11: Multi-Tape Turing Machines, Nondeterministic Turing Machines, and the Church-Turing Thesis

## What Will Happen During the Lecture

### Remember... You Had Homework!

Students were asked to work through the following set of lecture notes before this lecture.

- Lecture Notes — “Multi-Tape Turing Machines, Nondeterministic Turing Machines, and the Church-Turing Thesis”.

As always, you may attend the lecture presentation if you have not worked through this material ahead of time — but it will not be repeated for you, and you might get a little bit lost, during the presentation, if you haven’t worked through this.

### Problems To Be Solved

Supplemental material from the previous lecture concerned the use of *refinement* for Turing machine design. This will be introduced (or re-introduced) in the lecture presentation and applied to develop a Turing machine to compute the function  $f_{+1} : \Sigma_1^* \rightarrow \Sigma_2^*$  (for  $\Sigma_1 = \Sigma_2 = \{0, 1\}$ ) considered in the lecture presentation for Lecture #10.