

Lecture #12: Universal Turing Machines

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 — “Universal Turing Machines”.

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

The discussion of Turing machine design, from the previous lecture, will be continued: A multi-tape Turing machine, computing an “addition” function, will be described — in order to supply evidence that Turing machine design really *does* get easier when multi-tape Turing machines can be used.

Future lectures will repeatedly make use of the fact that the languages of valid encodings of Turing machines, and of Turing machines and their input strings, are both ***decidable*** languages. A proof of the decidability of these languages will be briefly discussed.