Lecture #12: Universal Turing Machines
Questions for Review

1. Describe any new **assumptions** or **restrictions**, concerning Turing machines, that have now been introduced. Are either, or both, of the sets of "recognizable languages" and "decidable languages" changed, if they are defined using the new, slightly more restrictive model of a "Turing machine" that is now being used?

2. This lecture introduced an **encoding scheme** for Turing machines, as well as Turing machines and input strings for them. What features of alphabets, and languages defined using them, are not included (so that this information is "lost") when we only have the encodings of Turing machines, and their inputs, that have now been described?

3. What is a **universal Turing machine**?

4. Describe the language "TM" as precisely as you can. Is this language recognizable? Is it decidable?

5. Describe the language "TM+I" as precisely as you can.Is this language recognizable? Is it decidable?

6. Describe the language A_{TM} as precisely as you can? How is it related to the "universal Turing machine'" that this lecture introduced? What was proved about this language, in this lecture?