

Lecture #13: First Undecidable and Unrecognizable Languages

Questions for Review

1. Describe the languages TM and $TM+1$. Are they recognizable? Are they decidable?
2. Describe the language A_{TM} . Is this language recognizable? Is this decidable?
3. OK, OK... the language A_{TM} was proved to be **undecidable** in Lecture #13 — and this the first language proved to undecidable, so far, in this course.
What **proof technique** was used to prove this?
4. Now consider the **complement** A_{TM}^C of A_{TM} . Is *this* language decidable? Is it recognizable?
5. OK, OK... the language A_{TM}^C was proved to be **unrecognizable** in Lecture #13 — and this is the first language proved to be unrecognizable, in this course.
What **proof technique** was used to prove this?