

Maths for Computing

Tutorial 14

1. Prove that $L = \{\alpha \mid M_\alpha \text{ is a Turing machine that accepts at least one input}\}$ is undecidable but recognisable.
2. Prove that $E_{TM} = \{\alpha \mid L(M_\alpha) = \emptyset\}$ is undecidable.
3. Prove that $EQ_{TM} = \{(\alpha_1, \alpha_2) \mid L(M_{\alpha_1}) = L(M_{\alpha_2})\}$ is undecidable.