COMP4141 Tutorial 4
Turing Machines, Decidability

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Exercise 1 Give a detailed description of a Turing machine that decides the language L over alphabet $\{0, 1\}$ consisting of all strings with the same number of 0's as 1's.

Exercise 2 Let

$$L = \{\langle M \rangle \mid M \text{ is a DFA that doesn't accept any string containing an odd number of 1's}\}$$

Show that L is decidable.

Exercise 3 A nondeterministic Turing machine is a *decider* for a language L if for all inputs w, the every branch of the computation tree of the machine terminates, and $w \in L$ iff at least one branch accepts. Show that L is decided by a non-deterministic Turing machine iff L is decided by a deterministic Turing machine.