

An enumerator is a 2-tape TM with an attached printer and a set $P \subseteq Q$ of “print” states. Whenever the enumerator enters a print state, the contents of its second tape are sent to the printer. A language L is enumerable if there exists an enumerator M such that, on input ε (the empty string), M prints every element of L (possibly with repetitions). Note that if L is infinite, then M will never halt.

1. Prove that Σ^* is enumerable.
2. Prove that a language is recognizable if and only if it is enumerable.