A. Show that the time complexity class P is closed under concatenation.
B. A language $B$ is *NP-hard* if any language $A \in \text{NP}$ can be reduced to $B$ in deterministic polynomial time. A language $B$ is *PSPACE-hard* if any language $A \in \text{PSPACE}$ can be reduced to $B$ in deterministic polynomial time. Show that any PSPACE-hard language is also NP-hard.
C. Let $A$ be the set of all incompressible (according to our usual compression scheme) strings over $\{0, 1\}$. Is $A$ recognizable?
D. In the USA, (simplified) postal addresses are formatted as in the two examples below. The first line is the \textit{addressee}, an arbitrary string containing no carriage returns (ASCNCR). The second line is either a street address or a P.O. box. A \textit{street address} is one or more digits followed by an ASCNCR. A \textit{P.O. box} is “PO Box” followed by one or more digits. The third line consists of a city name (an ASCNCR with no commas), followed by a comma, followed by a two-letter state/territory code, followed by a ZIP code. The ZIP code is either five digits, or five digits followed by a dash and four digits. Write a regular expression for USA postal addresses as just described.

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E. Let \( A = \{ w#t : w, t \in \{0,1\}^*, w \text{ is a substring of } t \} \subseteq \{0,1,#\}^* \). Use the pumping lemma to prove that \( A \) is not context-free.
F. Let \( A = \{ \langle M \rangle : M \text{ is a Turing machine and } L(M) \text{ is finite} \} \). Show that \( A \) is not recognizable, by describing a mapping reduction from \( \text{HALT}_{TM} \) to \( A \).