# Lecture #11: Nonregular Expressions, Part Two

## Assumptions

- Preliminary material for this lecture has been reviewed.

## Objective

Use one or more ***closure properties*** to prove that a given language is not regular.

## Questions for Review

1. Say what a ***closure property*** is, and state at least four different properties, concerning regular languages, that have been proved in lectures or tutorial exercises.
2. Briefly describe a process — involving a closure property — that can be used to prove that a given language is ***not*** a regular language.
3. Why is it important that the Pumping Lemma for Regular Languages could *also* be used to prove that some languages are not regular?

## Problem To Be Solved

Let $\Sigma = \{\mathtt{a}, \mathtt{b}\}$. Prove that the language

$$L = \{\omega \in \Sigma^\star \mid \text{the number of } \mathtt{a}\text{'s in } \omega \text{ is equal to the number of } \mathtt{b}\text{'s in } \omega\}$$

is not regular.

***Solution:***