# CSE 322
## Intro to Formal Models in CS
## Homework #1
### Due: Friday 5 Oct 07

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Note: on this and all homework assignments, you are encouraged to talk to your classmates about the problems, brainstorm, trade ideas, but you are *not* allowed to carry away written notes from these discussions, nor are you allowed to use or borrow from others' written solutions to the problems. This means searching the internet, your friends' old course files, etc. are *not* allowed. Violation of these rules will be treated as academic misconduct.

Problem numbers and pages below are from the *first edition* of Sipser; scanned versions can be found on the course web page.

1. Text, 0.3, page 26.

2. Text, 0.5, page 26. Extra Credit: prove it by induction.

3. Text, 0.8, page 26.

4. Text, 1.1, page 83.

5. Text, 1.4 abcgim, page 84.

6. Using the following definition of string length,

$$|x| = \begin{cases} 0 & \text{if } x = \epsilon \\ |y| + 1 & \text{if } x = ya \text{ for some } y \in \Sigma^* \text{ and } a \in \Sigma. \end{cases}$$

   prove, by induction on $|v|$, that

$$\forall\, u, v \in \Sigma^*,\ |uv| = |u| + |v|.$$