

**COMP 301**  
**Assignment 3**  
**Due 10:30, Thursday, October 17, 2002**  
All problems are of equal value.

## Reading

Sipser, Chapter 2.

## Practice

Sipser, 2.1, 2.2, 2.4, 2.5, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.16, 2.17, 2.22, 2.23.

## To Be Handed In

1. Sipser, 2.3.
2. For each of the languages in Sipser 2.6, show they are context-free by either constructing a PDA or a CFG.
3. Sipser, 2.15.
4. Sipser, 2.18.
5. What is the language generated by the following grammar? Prove your answer.

$$S \rightarrow aS \mid Sb \mid bSa \mid \epsilon.$$

## Bonus

Sipser, 2.26.