

### Exercise 6.12.

- a. Show that if  $L$  is a CFL and  $F$  is finite,  $L - F$  is a CFL.
- b. Show that if  $L$  is not a CFL and  $F$  is finite,  $L - F$  is not a CFL.
- c. Show that if  $L$  is not a CFL and  $F$  is finite,  $L \cup F$  is not a CFL.

### Exercise 6.13.

For each part below, say whether the statement is true or false, and give reasons for your answer.

- a. Show that if  $L$  is a CFL and  $F$  is regular,  $L - F$  is a CFL.
- b. Show that if  $L$  is not a CFL and  $F$  is regular,  $L - F$  is not a CFL.
- c. Show that if  $L$  is not a CFL and  $F$  is regular,  $L \cup F$  is not a CFL.

### **Theorem 6.13.**

If  $L_1$  is a context-free language and  $L_2$  is a regular language, then  $L_1 \cap L_2$  is a CFL.

### Exercise 6.8.

Show that if  $L_1$  is a DCFL and  $L_2$  is regular, then  $L_1 \cap L_2$  is a DCFL.