

P216.**Exercises for Section 4.3**

Exercise 4.3.1: The following is a grammar for regular expressions over symbols a and b only:

```
rexpr -> rexpr + rterm | rterm
rterm -> rterm rfactor | rfactor
rfactor -> rfactor * | rprimary
rprimary -> a | b
```

- a) Left factor this grammar.
- b) Does left factoring make the grammar suitable for top-down parsing?
- c) In addition to left factoring, eliminate left recursion from the original grammar.
- d) Is the resulting grammar suitable for top-down parsing?

Exercise 4.3.2: Repeat Exercise 4.3.1 on the following grammars:

- a) The grammar of Exercise 4.2.1.
- b) The grammar of Exercise 4.2.2(a).
- c) The grammar of Exercise 4.2.2(c).

P231.**Exercises for Section 4.4**

Exercise 4.4.1: For each of the following grammars, devise predictive parsers and show the parsing tables. You may left-factor and/or eliminate left-recursion from your grammars first.

- a) The grammar of Exercise 4.2.2(a).
- b) The grammar of Exercise 4.2.2(b).
- c) The grammar of Exercise 4.2.2(c).

Exercise 4.4.3: Compute FIRST and FOLLOW for the grammar of Exercise 4.2.1.

Exercise 4.4.4: Compute FIRST and FOLLOW for each of the grammars of Exercise 4.2.2: (a), (b), (c).