

Homework 1

(10 points)

Lex: A lexical analyser generator

The goal of this exercise is to build a lexical analyser for a small Pascal-like programming language using the scanner generator *lex* (or its open source implementation *flex*). An example program `sample.pas` in the “Mini-Pascal” language is attached to this exercise sheet.

Do the following tasks:

1. Identify and enumerate all the tokens in the program; **(1 point)**
2. Write a lexical analyser that recognises all the tokens; **(3 point)**
3. Report lexical errors and the line numbers where they occur; **(1 point)**
4. Generate a new source program that:
 - a. capitalises all keywords; **(1 point)**
 - b. writes all identifiers in lower case letters; **(1 point)**
 - c. eliminates all redundant whitespaces (multiple empty lines, space- and tab- characters) ; **(1 point)**
 - d. transform all comments into old style Pascal comments; **(1 point)**
 - i. *Example:* (* This is an old style Pascal comment *)
5. Write a new example program of at least 20 lines which implements a well-known algorithm and contains at least five lexical errors that should be reported by the scanner. **(1 point)**