Compiler Design Homework 1
Due Before Week 2 Class

Write a Standalone Scanner

- Write a program to scan a simple line of code and identify the different groups of characters (tokens, etc.) in the input. Translation of the input should be **case insensitive**. Please do your work in C or C++. Use a file with the following line of code (with a carriage return at the end) as input:

  if (ed = 10) then return; else ED = ed+1; end;

- Output should include a copy of the input and a list of character groups in the following format: **Note:** Every character in the input line (including the spaces and carriage return) should appear between quote marks in this list. (designate the carriage return as "\n")

  if (ed = 10) then return; else ED = ed+1; end;
  ("if", KW), (" ", WS), ("(", SYM), ("ed", ID), (" ", WS), …, ("\n", WS)

- Use the following token kind (type) designators for the categories:
  - **KW** Keyword (ie: **if**, **then**, **else**, **end**, **return**)
  - **WS** White Space (ie: spaces, tabs, carriage return)
  - **SYM** Symbol or Special Character (ie: '**(**', '**)**', '**=**', '**+**', '**;**')
  - **ID** Identifier (a text group that is not a keyword, e.g. **ed**)
  - **NUM** Number (a group of one or more digits)
- Use the input file **HW1-Input.txt** to generate the output file to be handed in.
- Your scanner should report how many logical tests (if or while statements) were executed by the scanner to identify each token kind. Include a totals line. I recommend adding **(++count and (...))** to each "**if**" and "**while**" statement for accuracy. If you do comparisons, you must also include a count of them in your report.

Read Louden Chapters **1.0–1.5 (Compiler Organization)**, and **2.0-2.3.0 (Scanning)**

Submit all results to Blackboard before the Week 2 class.

- Submit a **zip** file containing a **readme.txt file** identifying and describing the other files, the **report** counting the number of tests, the **code** you wrote, the **executable** (identify the OS in the readme file), and the **output file** your code generated. **Submit the zip file to Blackboard before the Week 2 class.**
- **Note: The submission point in Blackboard is in the module for the week the homework is assigned because putting it in a future module could make it inaccessible to you when you complete the homework.**