**CS 431 *PROJECT 1: C Parser* SPRING 2023**

This project is worth 100 points. For each of the requirements below, you will need to meet the full specifications for full credit for that item. Solutions that do not meet the full specifications will receive no credit for that item.

***NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ TOTAL:***

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| ***Specification*** | ***Points Earned*** |
| Processes requested file (2 pts each):   * Prompts user for file name. * Opens file * Verifies successful opening * Processes every line of file * Closes file when finished using file. | (10 pts) |
| Processes // comments   * Detects // (6 pts) * All characters following the comment on that line are ignored. (10 pts) | (16 pts) |
| Detects and tracks {([])} characters, enforcing C syntax rules (7 pts each):   * Detects { } symbols * Checks that every opening { has a closing } * Checks that there are not any } extra left over at the end of the file Detects [ ] symbols * Checks that every opening [ has a closing ] and that are not any ] extra left over at the end of the file * Detects ( ) symbols * Checks that every opening ( has a closing ) and that are not any ) extra left over at the end of the file * Verifies that the matching symbols appear in an order that follows C syntax rules. | (49 pts) |
| Output follows gcc style:   * if there are no syntax errors, there is no output (3 pts) * if there is a syntax error:   + the approximate line number is reported (5 pts)   + a specific (mostly accurate) error message is generated. (5 pts) | (13 pts) |
| Program follows good C programming style (2 pts each):   * Header comment: name of file, programmer name, date, description of program * #define is used for all constants (other than 0 and 1) and no unsafe functions are used (scanf(), etc). * Main function is declared as int main(void) and exits as return 0 for no error, and returns another number if there was an error. * Variables are declared inside of functions, at the top of the function, and are initialized. * Proper indentation is used inside functions and control structures (if/for/while/switch) * Each logical section of code is commented | (12 pts) |
| Extra Credit: If you earn 90% on the project, you may earn extra credit by completing these added features:   1. Detect comments that use /\* \*/ for both single line and multi-line, ignoring the contents of these comments. (+2%) 2. Detect double-quoted strings, that begin and end with “. (+2%) 3. Detect single-quoted characters that may appear in an *if* or *switch* statement. (+2%). For example: ‘{’, ‘}’, ‘(’, ‘)’, ‘[’, ‘]’ | (up to +6%) |

***Points Lost***

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| ***Specification*** | ***Points Lost*** |
| Late assignments will lose 10 percent for each portion of a day they are late, counting from the exact time that the program is due. | days \* (-10%) |
| Program does not compile on csci-madison – no credit for project. | (-100%) |