# Mnemonics Listing

|  |  |  |
| --- | --- | --- |
| **Token Name** | **Token Code** | **Mnemonic** |
| GOTO | 0 | GOTO |
| INTEGER | 1 | \_INT |
| TO | 2 | \_\_TO |
| DO | 3 | \_\_DO |
| IF | 4 | \_\_IF |
| THEN | 5 | THEN |
| ELSE | 6 | ELSE |
| FOR | 7 | \_FOR |
| OF | 8 | \_\_OF |
| WRITELN | 9 | WTLN |
| READLN | 10 | RDLN |
| BEGIN | 11 | \_BEG |
| END | 12 | \_END |
| VAR | 13 | \_VAR |
| WHILE | 14 | WHIL |
| UNIT | 15 | UNIT |
| LABEL | 16 | LABL |
| REPEAT | 17 | REPT |
| UNTIL | 18 | UNTL |
| PROCEDURE | 19 | PROC |
| DOWNTO | 20 | DOWN |
| FUNCTION | 21 | FUNC |
| RETURN | 22 | RTRN |
| REAL | 23 | REAL |
| STRING | 24 | \_STR |
| ARRAY | 25 | ARRY |
| / | 30 | \_DIV |
| \* | 31 | \_MUL |
| + | 32 | \_ADD |
| - | 33 | \_SUB |
| ( | 34 | LPAR |
| ) | 35 | RPAR |
| ; | 36 | SEMI |
| := | 37 | ASGN |
| > | 38 | \_\_GT |
| < | 39 | \_\_LT |
| >= | 40 | GTEQ |
| <= | 41 | LTEQ |
| = | 42 | \_\_EQ |
| <> | 43 | NTEQ |
| , | 44 | COMM |
| [ | 45 | LBRC |
| ] | 46 | RBRC |
| : | 47 | COLN |
| . | 48 | \_DOT |
| IDENTIFIER | 50 | IDNT |
| INTEGER CONSTANT | 51 | INTC |
| FLOATING-POINT CONSTANT | 52 | FLTC |
| STRING CONSTANT | 53 | STRC |
| UNDEFINED | 99 | UNDF |

# DFA State Diagram

Diagram

Description automatically generated

# Test Input File Run

{Here is Lexical Test file 1 # \*) which

has a comment that

spans 3 lines }

{}

a:=1;

|Token: a | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 0|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: 1 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 1|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

b:=a+b-c\*21.7/22;

|Token: b | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 2|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: a | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 0|

|Token: + | Token Code: 32 | Mneumonic: \_ADD | Symbol Table Index: |

|Token: b | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 2|

|Token: - | Token Code: 33 | Mneumonic: \_SUB | Symbol Table Index: |

|Token: c | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 3|

|Token: \* | Token Code: 31 | Mneumonic: \_MUL | Symbol Table Index: |

|Token: 21.7 | Token Code: 52 | Mneumonic: FLTC | Symbol Table Index: 4|

|Token: / | Token Code: 30 | Mneumonic: \_DIV | Symbol Table Index: |

|Token: 22 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 5|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

12345678911234567892123456789312 (\*this number is 32 chars \*)

WARNING: Token length exceeds 16. Token has been truncated.

|Token: 1234567891123456 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 6|

12345678911234567892123456789333 (\*this number is 32 chars, but should be same as above in symbol table \*)

WARNING: Token length exceeds 16. Token has been truncated.

|Token: 1234567891123456 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 6|

hereisareallylongidentifierthatistoolong := 66;

WARNING: Token length exceeds 30. Token has been truncated.

|Token: hereisareallylongidentifiertha | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 7|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: 66 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 8|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

hereisareallylongidentifierthatissameasabovetruncated := 76.5E-22;

WARNING: Token length exceeds 30. Token has been truncated.

|Token: hereisareallylongidentifiertha | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 7|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: 76.5E-22 | Token Code: 52 | Mneumonic: FLTC | Symbol Table Index: 9|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

\*) {<-- Orphaned closed comment is just '\*' and ')' returned as separate tokens}

|Token: \* | Token Code: 31 | Mneumonic: \_MUL | Symbol Table Index: |

|Token: ) | Token Code: 35 | Mneumonic: RPAR | Symbol Table Index: |

myString\_1 : = "an unfinished string makes an error ;

|Token: myString\_1 | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 10|

|Token: : | Token Code: 47 | Mneumonic: COLN | Symbol Table Index: |

|Token: = | Token Code: 42 | Mneumonic: \_\_EQ | Symbol Table Index: |

WARNING: End of line was reached before " was found to close string.

|Token: an unfinished string makes an error ; | Token Code: 53 | Mneumonic: STRC | Symbol Table Index: 11|

test of single #and two char tokens

|Token: test | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 12|

|Token: of | Token Code: 8 | Mneumonic: \_\_OF | Symbol Table Index: |

|Token: single | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 13|

|Token: # | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: and | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 14|

|Token: two | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 15|

|Token: char | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 16|

|Token: tokens | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 17|

# /\*^&%+- and some more ( ) (\*\*) ;:=><>=<==<>,[]:.

|Token: # | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: / | Token Code: 30 | Mneumonic: \_DIV | Symbol Table Index: |

|Token: \* | Token Code: 31 | Mneumonic: \_MUL | Symbol Table Index: |

|Token: ^ | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: & | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: % | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: + | Token Code: 32 | Mneumonic: \_ADD | Symbol Table Index: |

|Token: - | Token Code: 33 | Mneumonic: \_SUB | Symbol Table Index: |

|Token: and | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 14|

|Token: some | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 18|

|Token: more | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 19|

|Token: ( | Token Code: 34 | Mneumonic: LPAR | Symbol Table Index: |

|Token: ) | Token Code: 35 | Mneumonic: RPAR | Symbol Table Index: |

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: > | Token Code: 38 | Mneumonic: \_\_GT | Symbol Table Index: |

|Token: <> | Token Code: 43 | Mneumonic: NTEQ | Symbol Table Index: |

|Token: = | Token Code: 42 | Mneumonic: \_\_EQ | Symbol Table Index: |

|Token: <= | Token Code: 41 | Mneumonic: LTEQ | Symbol Table Index: |

|Token: = | Token Code: 42 | Mneumonic: \_\_EQ | Symbol Table Index: |

|Token: <> | Token Code: 43 | Mneumonic: NTEQ | Symbol Table Index: |

|Token: , | Token Code: 44 | Mneumonic: COMM | Symbol Table Index: |

|Token: [ | Token Code: 45 | Mneumonic: LBRC | Symbol Table Index: |

|Token: ] | Token Code: 46 | Mneumonic: RBRC | Symbol Table Index: |

|Token: : | Token Code: 47 | Mneumonic: COLN | Symbol Table Index: |

|Token: . | Token Code: 48 | Mneumonic: \_DOT | Symbol Table Index: |

(\*reserve words

below........................... \*) "but first is a good string"

|Token: but first is a good string | Token Code: 53 | Mneumonic: STRC | Symbol Table Index: 20|

GOTO JumpOut; INTEGER TO DO

|Token: GOTO | Token Code: 0 | Mneumonic: GOTO | Symbol Table Index: |

|Token: JumpOut | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 21|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

|Token: INTEGER | Token Code: 1 | Mneumonic: \_INT | Symbol Table Index: |

|Token: TO | Token Code: 2 | Mneumonic: \_\_TO | Symbol Table Index: |

|Token: DO | Token Code: 3 | Mneumonic: \_\_DO | Symbol Table Index: |

begin if not this then that else nothing

|Token: begin | Token Code: 11 | Mneumonic: \_BEG | Symbol Table Index: |

|Token: if | Token Code: 4 | Mneumonic: \_\_IF | Symbol Table Index: |

|Token: not | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 22|

|Token: this | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 23|

|Token: then | Token Code: 5 | Mneumonic: THEN | Symbol Table Index: |

|Token: that | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 24|

|Token: else | Token Code: 6 | Mneumonic: ELSE | Symbol Table Index: |

|Token: nothing | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 25|

THEN ELSE

|Token: THEN | Token Code: 5 | Mneumonic: THEN | Symbol Table Index: |

|Token: ELSE | Token Code: 6 | Mneumonic: ELSE | Symbol Table Index: |

For I := 1 to 100.E7 of float do

|Token: For | Token Code: 7 | Mneumonic: \_FOR | Symbol Table Index: |

|Token: I | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 26|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: 1 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 1|

|Token: to | Token Code: 2 | Mneumonic: \_\_TO | Symbol Table Index: |

|Token: 100.E7 | Token Code: 52 | Mneumonic: FLTC | Symbol Table Index: 27|

|Token: of | Token Code: 8 | Mneumonic: \_\_OF | Symbol Table Index: |

|Token: float | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 28|

|Token: do | Token Code: 3 | Mneumonic: \_\_DO | Symbol Table Index: |

WRITELN

|Token: WRITELN | Token Code: 9 | Mneumonic: WTLN | Symbol Table Index: |

BEGIN

|Token: BEGIN | Token Code: 11 | Mneumonic: \_BEG | Symbol Table Index: |

END

|Token: END | Token Code: 12 | Mneumonic: \_END | Symbol Table Index: |

declare ARRAY

|Token: declare | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 29|

|Token: ARRAY | Token Code: 25 | Mneumonic: ARRY | Symbol Table Index: |

VAR WHILE UNIT LABEL REPEAT UNTIL done = TRUE;

|Token: VAR | Token Code: 13 | Mneumonic: \_VAR | Symbol Table Index: |

|Token: WHILE | Token Code: 14 | Mneumonic: WHIL | Symbol Table Index: |

|Token: UNIT | Token Code: 15 | Mneumonic: UNIT | Symbol Table Index: |

|Token: LABEL | Token Code: 16 | Mneumonic: LABL | Symbol Table Index: |

|Token: REPEAT | Token Code: 17 | Mneumonic: REPT | Symbol Table Index: |

|Token: UNTIL | Token Code: 18 | Mneumonic: UNTL | Symbol Table Index: |

|Token: done | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 30|

|Token: = | Token Code: 42 | Mneumonic: \_\_EQ | Symbol Table Index: |

|Token: TRUE | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 31|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

PROCEDURE DOWNTO does READLN RETURN

|Token: PROCEDURE | Token Code: 19 | Mneumonic: PROC | Symbol Table Index: |

|Token: DOWNTO | Token Code: 20 | Mneumonic: DOWN | Symbol Table Index: |

|Token: does | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 32|

|Token: READLN | Token Code: 10 | Mneumonic: RDLN | Symbol Table Index: |

|Token: RETURN | Token Code: 22 | Mneumonic: RTRN | Symbol Table Index: |

FLOAT

|Token: FLOAT | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 28|

STRING

|Token: STRING | Token Code: 24 | Mneumonic: \_STR | Symbol Table Index: |

Beginning not reserve writeln. !@#$%^&\*()\_+

|Token: Beginning | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 33|

|Token: not | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 22|

|Token: reserve | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 34|

|Token: writeln | Token Code: 9 | Mneumonic: WTLN | Symbol Table Index: |

|Token: . | Token Code: 48 | Mneumonic: \_DOT | Symbol Table Index: |

|Token: ! | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: @ | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: # | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: $ | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: % | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: ^ | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: & | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: \* | Token Code: 31 | Mneumonic: \_MUL | Symbol Table Index: |

|Token: ( | Token Code: 34 | Mneumonic: LPAR | Symbol Table Index: |

|Token: ) | Token Code: 35 | Mneumonic: RPAR | Symbol Table Index: |

|Token: \_ | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

|Token: + | Token Code: 32 | Mneumonic: \_ADD | Symbol Table Index: |

sum := 0.0;

|Token: sum | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 35|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: 0.0 | Token Code: 52 | Mneumonic: FLTC | Symbol Table Index: 36|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

sum := sum + 2;

|Token: sum | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 35|

|Token: := | Token Code: 37 | Mneumonic: ASGN | Symbol Table Index: |

|Token: sum | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 35|

|Token: + | Token Code: 32 | Mneumonic: \_ADD | Symbol Table Index: |

|Token: 2 | Token Code: 51 | Mneumonic: INTC | Symbol Table Index: 37|

|Token: ; | Token Code: 36 | Mneumonic: SEMI | Symbol Table Index: |

What if 2. is found?

|Token: What | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 38|

|Token: if | Token Code: 4 | Mneumonic: \_\_IF | Symbol Table Index: |

|Token: 2. | Token Code: 52 | Mneumonic: FLTC | Symbol Table Index: 39|

|Token: is | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 40|

|Token: found | Token Code: 50 | Mneumonic: IDNT | Symbol Table Index: 41|

|Token: ? | Token Code: 99 | Mneumonic: UNDF | Symbol Table Index: |

(\* end of file comes

before the end of this

comment-- Throw an Error! \*

WARNING: End of file found before comment terminated

SYMBOL TABLE

---------------------------------------------------------------------------------------------------------

|Name | Kind| DataType| Value|

---------------------------------------------------------------------------------------------------------

|A | Variable| Integer| 0|

|1 | Constant| Double| 1|

|B | Variable| Integer| 0|

|C | Variable| Integer| 0|

|21.7 | Constant| Double| 21.7|

|22 | Constant| Double| 22|

|1234567891123456 | Constant| Double| 1234567891123456|

|HEREISAREALLYLONGIDENTIFIERTHA | Variable| Integer| 0|

|66 | Constant| Double| 66|

|76.5E-22 | Constant| Double| 7.65E-21|

|MYSTRING\_1 | Variable| Integer| 0|

|an unfinished string makes an error ; | Constant| String| an unfinished string makes an error ;|

|TEST | Variable| Integer| 0|

|SINGLE | Variable| Integer| 0|

|AND | Variable| Integer| 0|

|TWO | Variable| Integer| 0|

|CHAR | Variable| Integer| 0|

|TOKENS | Variable| Integer| 0|

|SOME | Variable| Integer| 0|

|MORE | Variable| Integer| 0|

|but first is a good string | Constant| String| but first is a good string|

|JUMPOUT | Variable| Integer| 0|

|NOT | Variable| Integer| 0|

|THIS | Variable| Integer| 0|

|THAT | Variable| Integer| 0|

|NOTHING | Variable| Integer| 0|

|I | Variable| Integer| 0|

|100.E7 | Constant| Double| 1000000000|

|FLOAT | Variable| Integer| 0|

|DECLARE | Variable| Integer| 0|

|DONE | Variable| Integer| 0|

|TRUE | Variable| Integer| 0|

|DOES | Variable| Integer| 0|

|BEGINNING | Variable| Integer| 0|

|RESERVE | Variable| Integer| 0|

|SUM | Variable| Integer| 0|

|0.0 | Constant| Double| 0|

|2 | Constant| Double| 2|

|WHAT | Variable| Integer| 0|

|2. | Constant| Double| 2|

|IS | Variable| Integer| 0|

|FOUND | Variable| Integer| 0|

---------------------------------------------------------------------------------------------------------

C:\projects\CS4100\_Compiler\_Design\KyleBushCompiler\KyleBushCompiler\bin\Debug\netcoreapp3.1\KyleBushCompiler.exe (process 28820) exited with code 0.

To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.

Press any key to close this window . . .