Component Design:

Main

main (int argc, const char *argv[])
Create a scanner
Create a token
Have scanner start reading the file
Check for <identifiers>
Return 0

Print

Print (char source_name[], char date[])
Set the filename to source_name
get current time
set the page number to zero

printLine (char line[])
increment the line count
if line_count> page height Print header
print the string argument

PrintPageHeader ()
Print header (page number, source file name , current date)

PrintToken (Token *token)
Increment the line count
Default -> print token

printTreeRecursive (Identifier *identifier)
set LineNumberList
get TokenString
send identifier to binary tree

printTree (Identifier *identifier)
set proper labels and spaces
print identifier tree

Scanner

Scanner (FILE *source_file, char source_name[], char date[], Print printer)

Src_file= source_file
Copy (src_name, source name)
Copy (todays_date, date)
Initialize char table to identify what type of char we are looking at
Initialize Line numer=0
Source line [0] = '\0'

getSourceLine(char source_buffer)
create source buffer
create false Boolean
get a line from the filestream
if line received then true
return Boolean

getToken()

initialize a character code variable
skip past all the blanks
examine ch for LETTER, DIGIT, QUOTE, EOF, or SPECIAL
call appropriate function depending on ch
return new_token

getChar(char souce_buffer[])

set a temp char to EOF
if at the end of line ->return null character
else return the char at the index

skipBanks (char source_buffer[])

skip past the blanks
return pointer to the first non blank character

skipComments (char source_buffer[])

skip past the comments
return pointer to the first non blank character
watch for the EOF character

getWord (char *str, char *token_ptr. Token *tok)

Extract the word
Downshift the word, to make it lower case
Check if the word is a reserved word
If is not a reserved word its an identifier
Set token to identifier

getNumber (char *str, char *token_ptr, Token *tok)

extract number and convert it to a literal number

check if real or float
temp string number
set the token type to NUMBER

getString (char *str, char *token_ptr, Token *tok)

Initialize a temporary string
Whie char ch is not a '\''
    Read more characters
    Append characters to temp string
Set the setType to STRING_LIT
Set the setCode to STRING

getSpecial (char *str, char *token_ptr, Token *tok)

initialize the temp string
check for character operators (:,<,>,.,|)
    read next character
        if (= or .) -> append both to temp string
        else -> append first character to the temp string

downshiftWord (char word[])

make all characters in the incoming word lower case

isReservedWord (char *str, Token *tok)

Scan the token table for reserved words
If it is a reserved word -> set the token code member ->return True
Else -> return False

getLineNumer ()

return line_number

Token

Token ()
Initialize variables for binary search tree (lines, left, righ)

setCode (TokenCode newCode)
set newCode

getCode ()
Return token code member

setTokenString (string s)
setTokenString = s

getTokenString (string s)
return Token code member

LineNumberList

LineNumberList ()
Set val to 0
Set next to NULL

setLineNumberList (int num)
Set lineNumber =num

getLineNumberList ()
return LineNumber

setNextLineNumberList (LineNumberList *next)
Set nextLineNumber =next
getNextLineNumberList ()
return nextLineNumber

Identifier

Identifier (string val)
Set list = NULL
Set literal equal to val
tokenString is equal to val

setLeftChild (Identifier *tok)
set leftChild = tok
getLeftChild()
return leftChild

setRightChild (Identifier *tok)
set RightChild = tok
getRightChild()
return rightChild

getTokenString()
return literal

addToLineNumberList (LineNumberList *listItem)
if tmp is NULL list is listItem
else tmp= next line numner

setNextLineNumber to tmp

getLineNumberList()

return list

IdentifierBinaryTree

IdentifierBinaryTree()

Set value of treeRoot = NULL

depthFirstDeleteTree(Identifier *tok)

if tok->getLeftChild not NULL

    getLeftChild

if tok->getRightChild not NULL

    getRighChild

delete tok

setTreeRoot(Identifier *root)

Set value of treeRoot = root

getTreeRoot()

return treeRoot

addIdentifier2(Identifier* &head, Identifier* tok, int lineNum)

set false boolean called success

if head= NULL

    head= tok

    add head ToLineNumberList

    set success to true

getTokenString and set leftChild, rightChild or head appropriately

Integer

Integer()
Set value to “INTEGER”
Return int

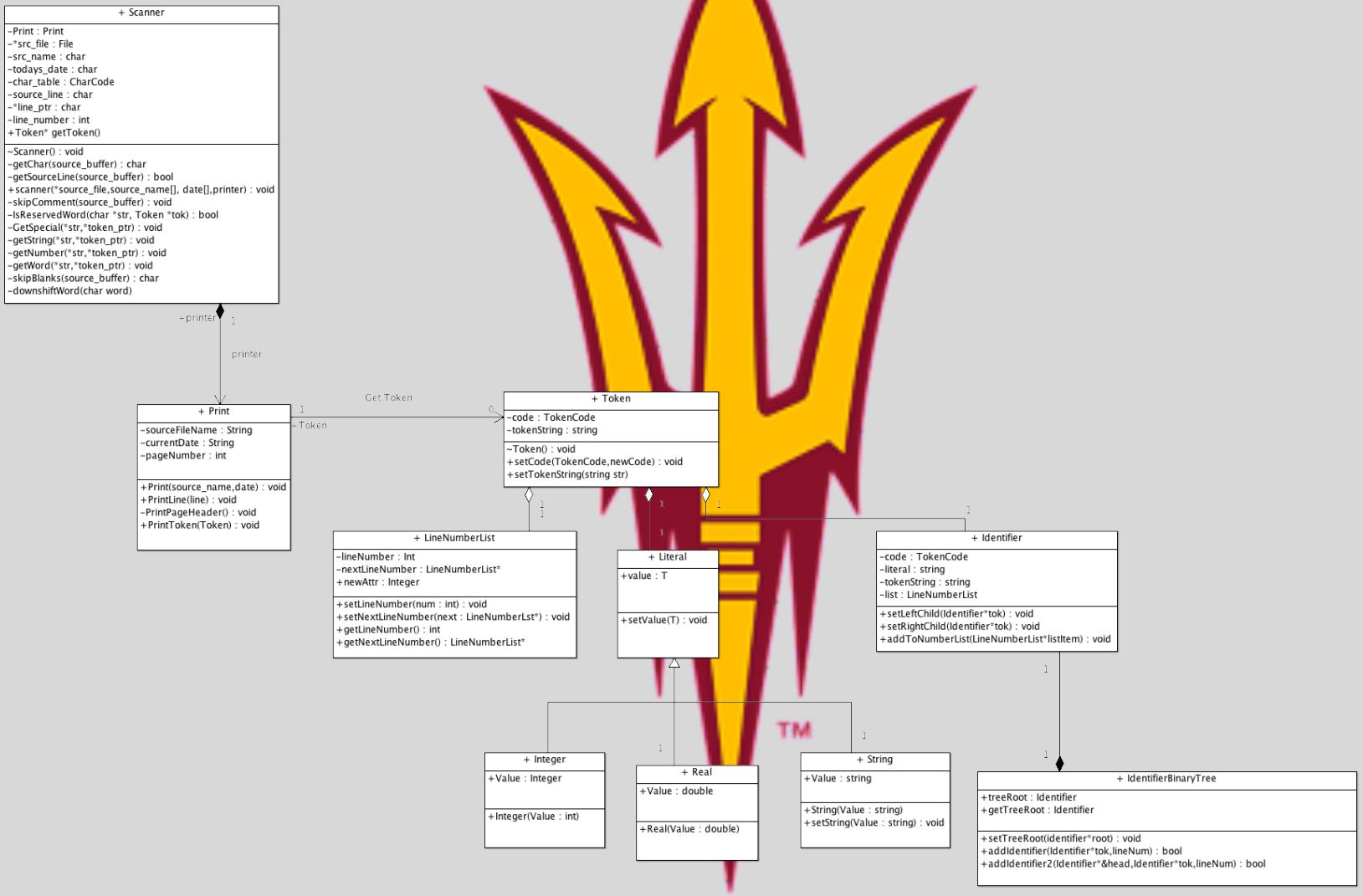
Real

Real()
Set value to “REAL”
Return double

String

setString(string value)
Set value to “String”
Return value

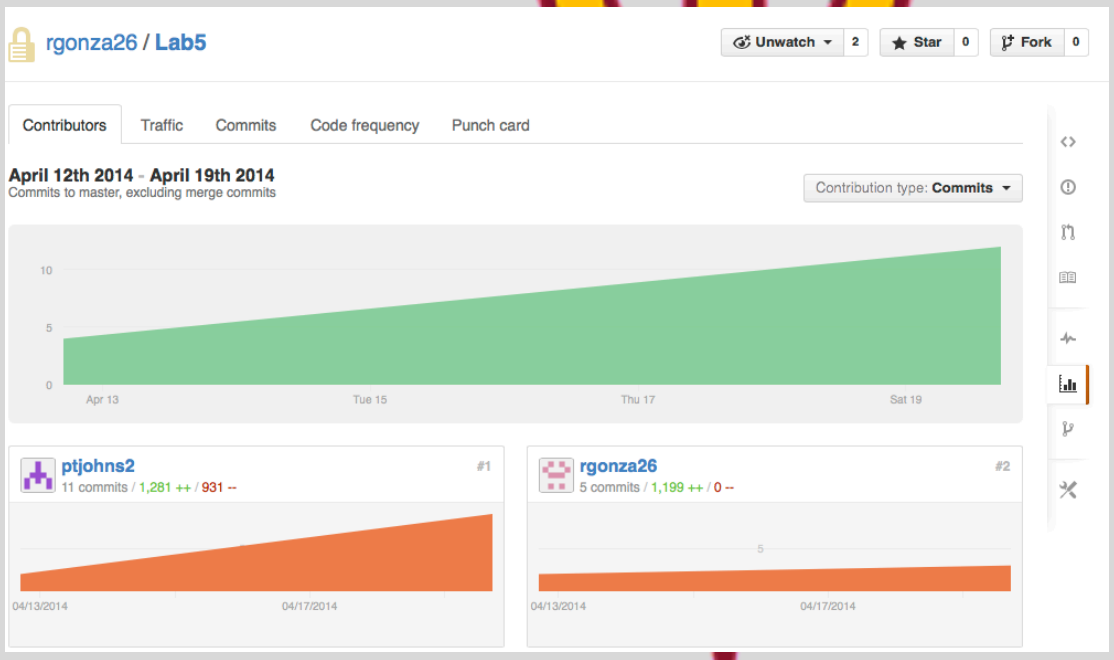
UML DIAGRAM


+ Scanner
-Print : Print
-*src_file : File
-src_name : char
-todays_date : char
-char_table : CharCode
-source_line : char
-*line_ptr : char
-line_number : int
+Token* getToken()
~Scanner() : void
-getChar(source_buffer) : char
-getSourceLine(source_buffer) : bool
+scanner(*source_file,source_name[], date[],printer) : void
-skipComment(source_buffer) : void
-IsReservedWord(char *str, Token *tok) : bool
-GetSpecial(*str,*token_ptr) : void
-getString(*str,*token_ptr) : void
-getNumber(*str,*token_ptr) : void
-getWord(*str,*token_ptr) : void
-skipBlanks(source_buffer) : char
-downshiftWord(char word)
+printer
1
printer
+ Print
-sourceFileName : String
-currentDate : String
-pageNumber : int
+Print(source_name,date) : void
+PrintLine(line) : void
-PrintPageHeader() : void
+PrintToken(Token) : void
Get Token
1
+ Token
0
+ Token
-code : TokenCode
-tokenString : string
~Token() : void
+setCode(TokenCode,newCode) : void
+setTokenString(string str)
+ LineNumberList
-lineNumber : Int
-nextLineNumber : LineNumberList*
+newAttr : Integer
+setLineNumber(num : int) : void
+setNextLineNumber(next : LineNumberLst*) : void
+getLineNumber() : int
+getNextLineNumber() : LineNumberList*
+ Literal
+value : T
+setValue(T) : void
+ Identifier
-code : TokenCode
-literal : string
-tokenString : string
-list : LineNumberList
+setLeftChild(Identifier*tok) : void
+setRightChild(Identifier*tok) : void
+addToNumberList(LineNumberList*listItem) : void
+ Integer
+Value : Integer
+Integer(Value : int)
+ Real
+Value : double
+Real(Value : double)
+ String
+Value : string
+String(Value : string)
+setString(Value : string) : void
+ IdentifierBinaryTree
+treeRoot : Identifier
+getTreeRoot : Identifier
+setTreeRoot(identifier*root) : void
+addIdentifier(Identifier*tok,lineNum) : bool
+addIdentifier2(Identifier*&head,Identifier*tok,lineNum) : bool
TM

Team Contribution Table

Name	Login	Score (0= No contribution 2= good contribution)
Peter Johnson	ptjohns2	2
Roberto Gonzalez	rgonza26	2

URL to Repository: https://github.com/rgonza26/Lab5



Testing

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
main	argv		
Test 1	V	Program Produces Expected Results	Expected result
Test 2	I	Application Crashes	Expected result

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
print	sourceFileName		
Test 3	V	File Name matches valid flie name	Expected result
Test 4	I	File Name does not match valid file name	Expected result
printLine	line		
Test 5	V	prints line	Expected result
Test 6	I	prints nothing	Expected result
printPageHeader			
Test 7		prints header	Expected result
printToken	Token		
Test 8	V (4)	Prints the integer literal	Expected result
Test 9	V (3.1)	Prints the Float literal	Expected result
Test 10	V ("test")	Prints the STRING literal	Expected result
Test 11	V ("PROGRAM")	Prints the Token	Expected result
Test 12	I	Nothing Prints NO_Token type	Expected result
printTreeRecursive	Identifier		
Test	V	Identifier gets added to leftChild, RightChild	Expected Result
Test	I	tree error	

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
Scanner	Tested during Main		
getSourceLine	Tested during Main		
getToken	Tested during Main		
getChar	source_buffer		
Test 13	V ("test)	returns 't'	Expected result
Test 14	I ""	returns"	Expected result
skipBlanks	source_buffer		
Test 15	V (two spaces)	returns 2	Expected result
Test 16	I (spaces here"	returns 1	Expected result
skipComment	source_buffer		
Test 17	V "this is a {comment}"	Removes Comment from source line	Expected result
Test 18	I "this is a comment"	Prints the line	Expected result
getWord	ch		
Test 19	V 'a'	Tested during print	Expected result
Test 20	I '{'	Empty token string	Expected result
getNumber	ch		
Test 21	V '5'	Tested during print	Expected result
Test 22	I '{'	Empty token string	Expected result
getString	ch		
Test 23	V	Tested during print	Expected result
Test 24	I '{'	Empty token string	Expected result
getSpecial	str		
Test 25	V "program"	returns 1	Expected result
Test 26	I 'nothing"	returns false	Expected result

downshitfWord	char		
Test 27	V 'OK'	ok	Expected result
Test 28	I '{'	Empty token string	Expected result
isREservedWord	ch		
Test 29	V"DO"	Tested during print	Expected result
Test 30	I '{'	Empty token string	Expected result

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
Token	Tested during Main		
setCode	Tested during Main		
getcode	TokenCode		
Test 31	V	new code is set	Expected result
Test 32	I	error no code set	Expected result
setTokenString	Tested during Main		
getTokenString	String		
Test 33	V	val is set to token string	Expected result
Test 34	I	Val is not set error	Expected result

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
LineNumberList			
setLineNumber	int		
Test 35	V	lineNumber = num	Expected result
Test 36	I	invalid	Expected result
setNextLineNumber	LineNumberList		

Test 37	V	nextLineNumber = next	Expected result
Test 38	I	Invalid	Expected result

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
Identifier			
setLeftChild	Identifier		
Test 39	V	this leftChild	Expected result
Test 40	I	Error	Expected result
setRightChild	Identifier		
Test 41	V	set RightChild	Expected result
Test 42	I	Error	Expected result
addToLineNumberList	LineNumberList		
Test 43	V	get NextLineNumber	Expected result
Test 44	I	Error	Expected result

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
IdentifierBinaryTree			
depthFirstDeleteTree	identifier		
Test 45	V	getLeftChild or getRightChild	Expected result
Test 46	I	invalid	Expected result
setTreeRoot	Identifier		
Test 47	V	treeRoot=root	Expected result
Test 48	I	Invalid	Expected result

Function	Parameter (V->Valid, I ->Invalid)	Expected Result	Acutal Result
Integer	int		
Real	double		
String	String