CSCI 316 Principles of Programming Languages Exam 2 April 2020

Download the Exam 2 Answer Document Microsoft Word document file. Every student at Queens College has access to Microsoft Office 365 via their QC e-mail account: https://qmail.cuny.edu. You do not even have to install Microsoft Word on your computer to use it.

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After you complete the exam, follow the submission instructions on page 4.

Question

You will write the recursive descent parser code for the ADALS1 grammar given on page 2. The list of lexeme and token codes are given on page 3.

In the video lectures, we saw the code written for the nonterminal symbols <S>, <DECPART>, and <OBJECTDEC>. That code is already included in the **Exam 2 Answer Document** file. You just need to write the code for the rest of the grammar.

Remember, the nextToken variable is a global variable to all the methods and the method la.getToken() returns the next token of the source code ADALS1 input program. You need to include a call to the error function at each point within your code where a syntax error occurs. Make sure to include the proper syntax error message as a string passed as a parameter to the error function. You do not need to write the code for the error function.

You do not need to compile or execute this code. This is not a programming assignment but an exam.

The maximum exam score is 20.

ADALS1 Grammar

```
<S> → procedure ident is <DECPART> begin <SEQOFSTMT> end ; EOI

<DECPART> → <OBJECTDEC> { <OBJECTDEC> }

<OBJECTDEC> → <IDENTLIST> : ( boolean | integer ) ;

<IDENTLIST> → ident { , <IDENTLIST> }

<SEQOFSTMT> → <STATEMENT> { <STATEMENT> }

<STATEMENT> → null ;
<STATEMENT> → ident := <EXPRESSION> ;
<STATEMENT> → if <CONDITION> then <SEQOFSTMT>
                           [ else <SEQOFSTMT> ] end if ;
<STATEMENT> → while <CONDITION> loop <SEQOFSTMT> end loop ;
<STATEMENT> → ( get | put ) ( <IDENTLIST> ) ;
<STATEMENT> → newline ;

<CONDITION> → <EXPRESSION>

<EXPRESSION> → <SIMPEXPR> [ ( = | /= | < | <= | > | >= ) <SIMPEXPR> ]

<SIMPEXPR> → <TERM> { ( + | - ) <TERM> }

<TERM> → <PRIMARY> { ( * | / | rem ) <PRIMARY> }

<PRIMARY> → ( <EXPRESSION> ) | ident | numlit | true | false
```

ADALS1 Lexeme List

Lexeme	Token Symbol
identifier	IDENT
numerical literal	NUMLIT
true	TRUESYM
false	FALSESYM
+	PLUS
not	NOTSYM
-	MINUS
*	TIMES
/	SLASH
rem	REMSYM
:	COLON
=	EQL
/=	NEQ
<	LSS
<=	LEQ
>	GTR
>=	GEQ
(	LPAREN
)	RPAREN
,	COMMA
;	SEMICOLON
end of input	EOI
:=	BECOMES
begin	BEGINSYM
end	ENDSYM
if	IFSYM
then	THENSYM
else	ELSESYM
while	WHILESYM
loop	LOOPSYM
get	GETSYM
put	PUTSYM
newline	NEWLINE
null	NULLSYM
boolean	BOOLSYM
integer	INTSYM
is	ISSYM
procedure	PROCSYM

Submission Instructions

Make sure you've properly renamed your **Exam 2 Answer Document** as described on Page 1.
After you finish typing your answers and save your document, save your document as a pdf file.
It is the pdf file that you will submit.

Once you submit your exam you will not be able to resubmit it!
Make absolutely sure the exam you want to submit is the exam you want graded.
There will be **NO** exceptions to this rule!

You will submit your pdf file via your CUNY BlackBoard account.
This is the only accepted submission method.

Follow these instructions:

Log onto your CUNY BlackBoard account.
Click on the CSCI 316 course link in the list of courses you're taking this semester.
Click on **Content** in the green area on the left side of the webpage.
You will see the **Exam 2**.
Click on the exam
Upload your pdf file and then click the submit button to submit your exam.

Due Date: Submit this exam by Monday, April 27, 2020.