

Compilers Program2 Readme

Team members

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Environment

- 使用Ubuntu20.04.1
- 需有以下套件

```
sudo apt-get install flex
sudo apt-get install bison
```

- Github地址

110-2-Compilers-Homework/hw3 at main · DandinPower/110-2-Compilers-Homework
Contribute to DandinPower/110-2-Compilers-Homework development by creating an account on GitHub.


 <https://github.com/DandinPower/110-2-Compilers-Homework/tree/main/hw3>

DandinPower/**110-2-Compilers-Homework**

 1 Contributor  0 Issues  1 Star  0 Forks

Target Language

- 使用Stanford CS143課程所提供的Coolc作為本次作業的target language
- 該語言的Document

 <http://web.stanford.edu/class/cs143/materials/cool-manual.pdf>

Grammar

```
0 $accept: program $end
1 program: clist
2 clist: clist class SYNTAX_OVER
3       | class SYNTAX_OVER
4 class: CLASS TYPE_ID BLOCKSTART flist_opt BLOCKOVER
5       | CLASS TYPE_ID INHERITS TYPE_ID BLOCKSTART flist_opt BLOCKOVER
6 flist_opt: flist
7           | %empty
8 flist: flist feature SYNTAX_OVER
9       | feature SYNTAX_OVER
10 feature: IDENTIFIER_ID ITEMSTART formal_list ITEMOVER DEFINE TYPE_ID BLOCKSTART expr BLOCKOVER
11         | IDENTIFIER_ID ITEMSTART ITEMOVER DEFINE TYPE_ID BLOCKSTART expr BLOCKOVER
```

```

12      | IDENTIFIER_ID DEFINE TYPE_ID ASSIGN expr
13      | IDENTIFIER_ID DEFINE TYPE_ID

14 formal_list: formal_list NEXT formal
15             | formal

16 formal: IDENTIFIER_ID DEFINE TYPE_ID

17 block_list: block_list expr SYNTAX_OVER
18            | expr SYNTAX_OVER

19 arguments_list: arguments
20               | %empty

21 arguments: arguments NEXT expr
22           | expr

23 action_list: action_list action
24            | action

25 action: IDENTIFIER_ID DEFINE TYPE_ID DO expr SYNTAX_OVER

26 let_action: IDENTIFIER_ID DEFINE TYPE_ID IN BLOCKSTART block_list BLOCKOVER
27            | IDENTIFIER_ID DEFINE TYPE_ID ASSIGN expr IN BLOCKSTART block_list BLOCKOVER

28 expr: IDENTIFIER_ID
29      | DIGIT
30      | BOOLEAN
31      | LETTER
32      | SELF
33      | BLOCKSTART block_list BLOCKOVER
34      | IDENTIFIER_ID ASSIGN expr
35      | expr DOT IDENTIFIER_ID ITEMSTART arguments_list ITEMOVER
36      | expr AT TYPE_ID DOT IDENTIFIER_ID ITEMSTART arguments_list ITEMOVER
37      | IDENTIFIER_ID ITEMSTART arguments_list ITEMOVER
38      | expr OPERATOR expr
39      | ITEMSTART expr ITEMOVER
40      | IF expr THEN expr ELSE expr FI
41      | WHILE expr LOOP expr POOL
42      | LET let_action
43      | CASE expr OF action_list ESAC
44      | NEW TYPE_ID
45      | ISVOID expr
46      | NOT expr
47      | INT_COMP expr

```

使用說明

- 編譯scanner跟parser

```

bison -vdt y coolc.y
flex coolc.l
gcc -o coolc y.tab.c lex.yy.c

```

- 使用parser辨識測試資料

```

./coolc < "Test case path"

```

輸出說明

- 輸出使用到的文法規則
 - EX. 如果使用reduce到expr的第5個規則就會輸出

```
expr 5
```

- 全部辨識完畢且正確
 - 輸出Done

```
Done!
```

輸出結果

- Test case #1
 - 輸入指令

```
./coolc < test/test1.txt
```

- 輸出結果

```
dandinpower123@ubuntu:~/Desktop/compilers/110-2-Compilers-Homework/hw3$ ./coolc < test/test1.txt
feature 4 flist 2 expr 1 expr 4 arguments 2 arguments_list 1 expr 8 feature 2 flist 1 flist_opt 1 clas
s 2 clist 2 feature 4 flist 2 expr 1 expr 4 arguments 2 arguments_list 1 expr 8 feature 2 flist 1 flis
t_opt 1 class 1 clist 1
Done!
dandinpower123@ubuntu:~/Desktop/compilers/110-2-Compilers-Homework/hw3$
```

- Test case #2
 - 輸入指令

```
./coolc < test/test2.txt
```

- 輸出結果

```
dandinpower123@ubuntu:~/Desktop/compilers/110-2-Compilers-Homework/hw3$ ./coolc < test/test2.txt
expr 17 expr 12 expr 4 arguments 2 arguments_list 1 expr 8 feature 2 flist 2 formal iformal_list 2expr
2 expr 1 expr 2 expr 11 expr 12 expr 19 expr 12 expr 1 expr 1 expr 11 expr 7 block_list 2 expr 1 expr
2 expr 11 expr 7 block_list 1 expr 6 expr 14 block_list 2 expr 1 block_list 1 let_action 2 expr 15 fe
ature 1 flist 1 flist_opt 1 class 1 clist 2
Done!
dandinpower123@ubuntu:~/Desktop/compilers/110-2-Compilers-Homework/hw3$
```

- Test case #3
 - 輸入指令

```
./coolc < test/sort_list.txt
```

- 輸出結果

```

dandinpower123@ubuntu:~/Desktop/compilers/110-2-Compilers-Homework/hw3$ ./coolc < test/sort list.txt
arguments_list 2 expr 10 block_list 2 expr 3 block_list 1 expr 6 feature 2 flist 2 formal iformal_list
2expr 17 expr 1 expr 1 arguments 2 expr 5 arguments 1 arguments_list 1 expr 8 block_list 2 let_action
2 expr 15 expr 12 feature 1 flist 1 arguments_list 2 expr 10 block_list 2 expr 17 block_list 1 expr 6
feature 2 flist 1 arguments_list 2 expr 10 block_list 2 expr 17 block_list 1 expr 6 feature 2 flist 1
arguments_list 2 expr 10 feature 2 flist 1 arguments_list 2 expr 10 feature 2 flist 1 formal iformal_
list 2arguments_list 2 expr 10 feature 1 flist 1 formal iformal_list 2arguments_list 2 expr 10 feature
1 flist 1 arguments_list 2 expr 10 feature 2 flist 1 flist_opt 1 class 2 clist 2 feature 4 flist 2 fe
ature 4 flist 1 expr 3 feature 2 flist 1 formal iformal_list 2formal iformal_list 1 expr 1 expr 7 bloc
k_list 2 expr 1 expr 7 block_list 1 expr 5 block_list 1 expr 6 feature 1 flist 1 expr 1 feature 2 flis
t 1 expr 1 feature 2 flist 1 expr 1 arguments_list 2 expr 8 expr 12 expr 1 arguments 2 arguments_list
1 expr 8 feature 2 flist 1 expr 1 arguments_list 2 expr 8 expr 12 expr 1 arguments 2 arguments_list 1
expr 8 feature 2 flist 1 formal iformal_list 2expr 1 expr 1 expr 11 expr 17 expr 12 expr 1 arguments 2
expr 5 arguments 1 arguments_list 1 expr 8 expr 17 expr 12 expr 1 arguments 2 expr 1 expr 1 arguments
2 arguments_list 1 expr 8 arguments 1 arguments_list 1 expr 8 expr 13 feature 1 flist 1 formal iforma
l_list 2expr 17 expr 12 expr 1 arguments 2 expr 1 expr 1 arguments 2 arguments_list 1 expr 8 arguments
1 arguments_list 1 expr 8 feature 1 flist 1 expr 1 arguments 2 arguments_list 1 expr 10 block_list 2
expr 4 arguments 2 arguments_list 1 expr 10 block_list 1 expr 1 arguments_list 2 expr 8 block_list 1 e
xpr 6 feature 2 flist 1 flist_opt 1 class 2 clist 1 expr 3 feature 2 flist 2 expr 5 feature 2 flist 1
expr 5 feature 2 flist 1 formal iformal_list 2expr 1 arguments 2 arguments_list 1 expr 10 feature 1 fl
ist 1 formal iformal_list 2expr 17 expr 12 expr 1 arguments 2 expr 5 arguments 1 arguments_list 1 expr
8 feature 1 flist 1 expr 3 feature 2 flist 1 flist_opt 1 class 2 clist 1 feature 4 flist 2 formal ifo
rmal_list 2expr 17 expr 7 block_list 2 expr 2 expr 1 expr 1 expr 11 expr 17 expr 12 expr 1 arguments 2
expr 1 arguments 1 arguments_list 1 expr 8 expr 7 block_list 2 expr 1 expr 2 expr 11 expr 7 block_lis
t 1 expr 6 expr 14 block_list 2 let_action 2 expr 15 expr 12 block_list 1 expr 1 block_list 1 expr 6 f
eature 1 flist 1 expr 4 arguments 2 arguments_list 1 expr 10 block_list 2 arguments_list 2 expr 10 arg
uments 2 arguments_list 1 expr 10 arguments_list 2 expr 8 arguments_list 2 expr 8 arguments_list 2 exp
r 8 block_list 1 expr 6 feature 2 flist 1 flist_opt 1 class 2 clist 1
Done!
dandinpower123@ubuntu:~/Desktop/compilers/110-2-Compilers-Homework/hw3$

```