Project #1. Scanner

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Environment

Ubuntu 18.04.6 LTS

main.c

NO_PARSE와 TraceScan을 True로 바꿔준다.

globals.h

MAXRESERVED를 6으로 바꿔준다.

reserved words에서 THEN, END, REPEAT, UNTIL, READ, WRITE를 제거하고 WHILE, RETURN, INT, VOID로 바꿔준다.

special symbols에 NE, LE, GT, GE, LBRACE, RBRACE, LCURLY, RCURLY, COMMA를 추가한다.

util.c

reserved words에서 바뀐 token들을 바꿔주고, 새로 추가된 special symbols들을 추가해준다.

ASSIGN은 =이 출력되도록 "=₩n"으로 바꿔준다.

Method 1

scan.c에서 state에 INLT, INGT, INNE, INOVER, INCOMMENT_를 추가해준다. 바뀐 reserved words들을 추가해주고, 원하는 기능을 하도록 getToken()을 바꿔준다.

make 명령어를 통해 컴파일하면 cminus_cimpl 실행파일이 생성되는데, 이를 이용하여 결과를 출력한다.

Method 2

cminus.l의 definition section에서 identifier를 바꿔주고, rule section에서 바뀐 reserved words와 special symbols를 반영하여 원하는 기능을 하도록 바꿔준다.

make 명령어를 통해 컴파일하면 cminus_lex 실행파일이 생성되는데, 이를 이용하여 결과를 출력한다.

Result

Method1 test.1.txt

```
lee@lee-VirtualBox:~/2022_ele4029_2018008813/1_Scanner$ ./cminus_cimpl test.1.txt

TINY COMPILATION: test.1.txt
        4: reserved word: int
        4: ID, name= gcd
        4: (
        4: reserved word: int
        4: ID, name= u
        4: ,
        4: reserved word: int
        4: ID, name= v
        4: )
        5: {
        6: reserved word: if
        6: (
        6: ID, name= v
        6: ==
        6: NUM, val= 0
        6: )
        6: reserved word: return
        6: ID, name= u
        6: ;
        7: reserved word: else
        7: reserved word: return
        7: ID, name= gcd
        7: (
        7: ID, name= v
        7: ,
        7: ID, name= u
        7: -
        7: ID, name= u
        7: /
        7: ID, name= v
        7: *
        7: ID, name= v
        7: )
        7: ;
        9: }
        11: reserved word: void
        11: ID, name= main
        11: (
        11: reserved word: void
        11: )
        12: {
        12: }
        13: reserved word: int
        13: ID, name= x
        13: ;
        13: reserved word: int
        13: ID, name= y
        13: ;
        14: ID, name= x
        14: =
        14: ID, name= input
        14: (
        14: )
        14: ;
        14: ID, name= y
        14: =
        14: ID, name= input
        14: (
        14: )
        14: ;
        15: ID, name= output
        15: (
        15: ID, name= gcd
        15: (
        15: ID, name= x
        15: ,
        15: ID, name= y
        15: )
        15: )
        15: ;
        16: }
        17: EOF
```

Method2 test.1.txt

```
lee@lee-VirtualBox:~/2022_ele4029_2018008813/1_Scanner$ ./cminus_lex test.1.txt

TINY COMPILATION: test.1.txt
        4: reserved word: int
        4: ID, name= gcd
        4: (
        4: reserved word: int
        4: ID, name= u
        4: ,
        4: reserved word: int
        4: ID, name= v
        4: )
        5: {
        6: reserved word: if
        6: (
        6: ID, name= v
        6: ==
        6: NUM, val= 0
        6: )
        6: reserved word: return
        6: ID, name= u
        6: ;
        7: reserved word: else
        7: reserved word: return
        7: ID, name= gcd
        7: (
        7: ID, name= v
        7: ,
        7: ID, name= u
        7: -
        7: ID, name= u
        7: /
        7: ID, name= v
        7: *
        7: ID, name= v
        7: )
        7: ;
        9: }
        11: reserved word: void
        11: ID, name= main
        11: (
        11: reserved word: void
        11: )
        12: {
        13: reserved word: int
        13: ID, name= x
        13: ;
        13: reserved word: int
        13: ID, name= y
        13: ;
        14: ID, name= x
        14: =
        14: ID, name= input
        14: (
        14: )
        14: ;
        14: ID, name= y
        14: =
        14: ID, name= input
        14: (
        14: )
        14: ;
        15: ID, name= output
        15: (
        15: ID, name= gcd
        15: (
        15: ID, name= x
        15: ,
        15: ID, name= y
        15: )
        15: )
        15: ;
        16: }
        17: EOF
```

Method1 test.2.txt

```
lee@lee-VirtualBox:~/2022_ele4029_2018008813/1_Scanner$ ./cminus_cimpl test.2.txt

TINY COMPILATION: test.2.txt
        1: reserved word: void
        1: ID, name= main
        1: (
        1: reserved word: void
        1: )
        2: {
        3: reserved word: int
        3: ID, name= i
        3: ;
        3: reserved word: int
        3: ID, name= x
        3: [
        3: NUM, val= 5
        3: ]
        3: ;
        5: ID, name= i
        5: =
        5: NUM, val= 0
        5: ;
        6: reserved word: while
        6: (
        6: ID, name= i
        6: <
        6: NUM, val= 5
        6: )
        7: {
        8: ID, name= x
        8: [
        8: ID, name= i
        8: ]
        8: =
        8: ID, name= input
        8: (
        8: )
        8: ;
        10: ID, name= i
        10: =
        10: ID, name= i
        10: +
        10: NUM, val= 1
        10: ;
        11: }
        13: ID, name= i
        10: ;
        11: }
        13: ID, name= i
        13: =
        13: NUM, val= 0
        13: ;
        14: reserved word: while
        14: (
        14: ID, name= i
        14: <=
        14: NUM, val= 4
        14: )
        15: {
        16: reserved word: if
        16: (
        16: ID, name= x
        16: [
        16: ID, name= i
        16: ]
        16: !=
        16: NUM, val= 0
        16: )
        17: {
        18: ID, name= output
        18: (
        18: ID, name= x
        18: [
        18: ID, name= i
        18: ]
        18: )
        18: ;
        19: }
        20: }
        21: }
        22: EOF
```

Method2 test.2.txt

```
lee@lee-VirtualBox:~/2022_ele4029_2018008813/1_Scanner$ ./cminus_lex test.2.txt

TINY COMPILATION: test.2.txt
        1: reserved word: void
        1: ID, name= main
        1: (
        1: reserved word: void
        1: )
        2: {
        3: reserved word: int
        3: ID, name= i
        3: ;
        3: reserved word: int
        3: ID, name= x
        3: [
        3: NUM, val= 5
        3: ]
        3: ;
        5: ID, name= i
        5: =
        5: NUM, val= 0
        5: ;
        6: reserved word: while
        6: (
        6: ID, name= i
        6: <
        6: NUM, val= 5
        6: )
        7: {
        8: ID, name= x
        8: [
        8: ID, name= i
        8: ]
        8: =
        8: ID, name= input
        8: (
        8: )
        8: ;
        10: ID, name= i
        10: =
        10: ID, name= i
        10: +
        10: NUM, val= 1
        10: ;
        11: }
        13: ID, name= i
        13: =
        13: NUM, val= 0
        13: ;
        14: reserved word: while
        14: (
        14: ID, name= i
        14: <=
        14: NUM, val= 4
        14: )
        15: {
        16: reserved word: if
        16: (
        16: ID, name= x
        16: [
        16: ID, name= i
        16: ]
        16: !=
        16: NUM, val= 0
        16: )
        17: {
        18: ID, name= output
        18: (
        18: ID, name= x
        18: [
        18: ID, name= i
        18: ]
        18: )
        18: ;
        19: }
        20: }
        21: }
        22: EOF
```