

- white space :

[ \t]

可能是 space 或者 tab

➤ newline :

\r?\n

可能為回車(\r)或者 EOF(\n)，但回車不一定出現

➤ comments :

1. `\/*.*([\r][\n]).*\*/`
2. `(\/*.*\n)`

第一種(`/* ... */`) 可跨行，第二種(`//`)就是單純一行然後後面放東西

## 5. 你寫這個作業所遇到的問題

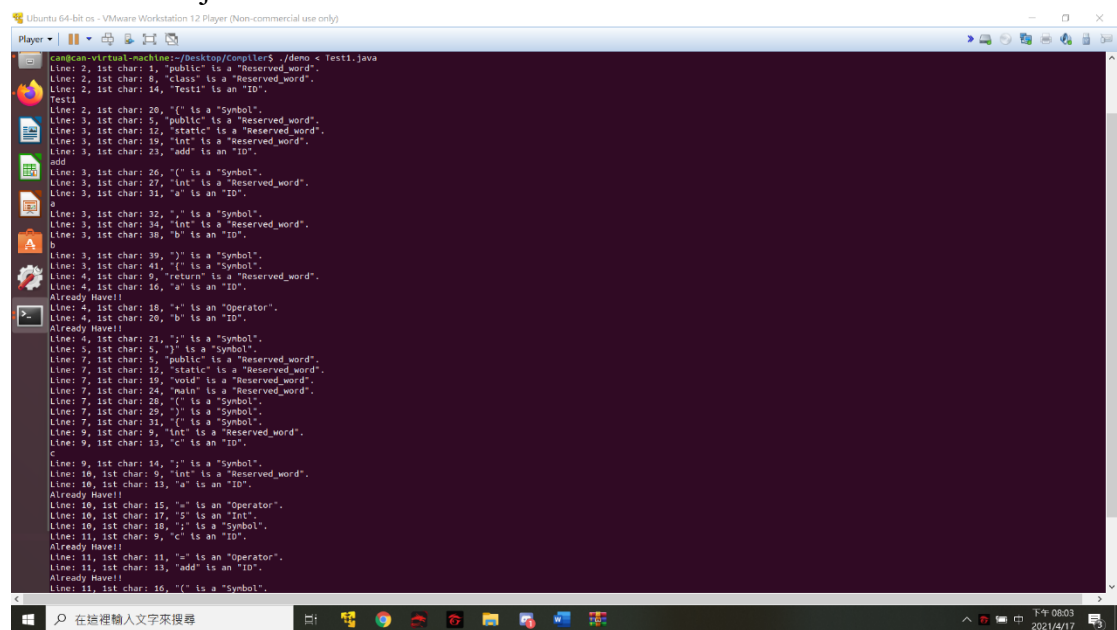
語法不熟、Invalid 的狀況沒有放前面導致讀不到、

makefile 怪怪的沒辦法分檔(.c&.h)之類的

invalid string 很難

## 6. 所有測試檔執行出來的結果，存成圖片

`./demo <Test1.java`



```
can@can-virtual-machine:~/Desktop/Compiler$ ./demo < Test1.java
Line: 2, 1st char: 1, "public" is a "Reserved_word".
Line: 2, 1st char: 8, "class" is a "Reserved_word".
Line: 2, 1st char: 14, "Test1" is an "ID".
Test1
Line: 2, 1st char: 20, "{" is a "Symbol".
Line: 3, 1st char: 5, "public" is a "Reserved_word".
Line: 3, 1st char: 12, "static" is a "Reserved_word".
Line: 3, 1st char: 19, "int" is a "Reserved_word".
Line: 3, 1st char: 23, "add" is an "ID".
add
Line: 3, 1st char: 26, "{" is a "Symbol".
Line: 3, 1st char: 27, "int" is a "Reserved_word".
Line: 3, 1st char: 31, "a" is an "ID".
a
Line: 3, 1st char: 32, "," is a "Symbol".
Line: 3, 1st char: 34, "int" is a "Reserved_word".
Line: 3, 1st char: 38, "b" is an "ID".
b
Line: 3, 1st char: 39, ";" is a "Symbol".
Line: 3, 1st char: 41, "{" is a "Symbol".
Line: 4, 1st char: 9, "return" is a "Reserved_word".
Line: 4, 1st char: 16, "a" is an "ID".
Already Have!
Line: 4, 1st char: 18, "+" is an "Operator".
Line: 4, 1st char: 20, "b" is an "ID".
Already Have!
Line: 4, 1st char: 21, ";" is a "Symbol".
Line: 5, 1st char: 5, "}" is a "Symbol".
Line: 7, 1st char: 5, "public" is a "Reserved_word".
Line: 7, 1st char: 12, "static" is a "Reserved_word".
Line: 7, 1st char: 19, "void" is a "Reserved_word".
Line: 7, 1st char: 24, "main" is a "Reserved_word".
Line: 7, 1st char: 28, "{" is a "Symbol".
Line: 7, 1st char: 29, ";" is a "Symbol".
Line: 7, 1st char: 31, "{" is a "Symbol".
Line: 9, 1st char: 9, "int" is a "Reserved_word".
Line: 9, 1st char: 13, "c" is an "ID".
c
Line: 9, 1st char: 14, ";" is a "Symbol".
Line: 10, 1st char: 9, "int" is a "Reserved_word".
Line: 10, 1st char: 13, "a" is an "ID".
Already Have!
Line: 10, 1st char: 15, "=" is an "Operator".
Line: 10, 1st char: 17, "c" is an "ID".
Line: 10, 1st char: 19, ";" is a "Symbol".
Line: 11, 1st char: 9, "c" is an "ID".
Already Have!
Line: 11, 1st char: 11, "-" is an "Operator".
Line: 11, 1st char: 13, "add" is an "ID".
Already Have!
Line: 11, 1st char: 16, "{" is a "Symbol".
```

```
Line: 15, 1st char: 19, 'c' is an 'ID'.
Already Have!
Line: 15, 1st char: 20, ')' is a 'Symbol'.
Line: 15, 1st char: 21, ' ' is a 'Symbol'.
Line: 16, 1st char: 9, 'print' is a 'Reserved_word'.
Line: 16, 1st char: 14, 'c' is a 'Symbol'.
Line: 16, 1st char: 15, 'Hello world' is a 'String'.
Line: 16, 1st char: 28, ')' is a 'Symbol'.
Line: 16, 1st char: 29, ' ' is a 'Symbol'.
Line: 18, 1st char: 5, 'j' is a 'Symbol'.
Line: 20, 1st char: 1, 'j' is a 'Symbol'.
The symbol table contains:
Test1
add
a
b
c
cangcan-virtual-machine:~/Desktop/Compiler$ ./demo < Test2.java
' is an 'Comment'. 1, '/* this is a comment // line */ /* with /* delimiters */ before the end
Line: 3, 1st char: 1, 'public' is a 'Reserved_word'.
Line: 3, 1st char: 8, 'class' is a 'Reserved_word'.
Line: 3, 1st char: 14, 'test2' is an 'ID'.
Test2
Line: 3, 1st char: 20, '(' is a 'Symbol'.
Line: 4, 1st char: 5, 'int' is a 'Reserved_word'.
Line: 4, 1st char: 9, 'i' is an 'ID'.
Line: 4, 1st char: 21, '=' is an 'Operator'.
Line: 4, 1st char: 23, '100' is an 'int'.
Line: 4, 1st char: 27, ';' is a 'Symbol'.
Line: 5, 1st char: 5, 'double' is a 'Reserved_word'.
Line: 5, 1st char: 12, 'd' is an 'ID'.
Line: 5, 1st char: 14, '=' is an 'Operator'.
Line: 5, 1st char: 16, '12.25e4' is a 'float'.
Line: 5, 1st char: 24, ';' is a 'Symbol'.
Line: 7, 1st char: 5, 'public' is a 'Reserved_word'.
Line: 7, 1st char: 12, 'static' is a 'Reserved_word'.
Line: 7, 1st char: 19, 'void' is a 'Reserved_word'.
Line: 7, 1st char: 24, 'test' is a 'Reserved_word'.
Line: 7, 1st char: 28, '(' is a 'Symbol'.
Line: 7, 1st char: 29, ')' is a 'Symbol'.
Line: 7, 1st char: 31, '{' is a 'Symbol'.
Line: 8, 1st char: 1, '/* this is a comment // line with some /* and
// delimiters */' is an 'Comment'.
Line: 10, 1st char: 5, 'j' is a 'Symbol'.
Line: 11, 1st char: 1, 'j' is a 'Symbol'.
The symbol table contains:
Test2
t
d
cangcan-virtual-machine:~/Desktop/Compiler$
```

./demo < Test2.java

```
Line: 10, 1st char: 15, '=' is an 'Operator'.
Line: 10, 1st char: 17, '5' is an 'int'.
Line: 10, 1st char: 18, ' ' is a 'Symbol'.
Line: 11, 1st char: 9, 'c' is an 'ID'.
Already Have!
Line: 11, 1st char: 11, '=' is an 'Operator'.
Line: 11, 1st char: 13, 'add' is an 'ID'.
Already Have!
Line: 11, 1st char: 16, '(' is a 'Symbol'.
Line: 11, 1st char: 17, 'a' is an 'ID'.
Already Have!
Line: 11, 1st char: 18, ' ' is a 'Symbol'.
Line: 11, 1st char: 20, '10' is an 'int'.
Line: 11, 1st char: 22, ')' is a 'Symbol'.
Line: 11, 1st char: 23, ' ' is a 'Symbol'.
Line: 12, 1st char: 9, 'if' is a 'Reserved_word'.
Line: 12, 1st char: 12, 'c' is a 'Symbol'.
Line: 12, 1st char: 13, 'c' is an 'ID'.
Already Have!
Line: 12, 1st char: 15, '=' is an 'Invalid'.
Line: 12, 1st char: 17, '10' is an 'int'.
Line: 12, 1st char: 19, ')' is a 'Symbol'.
Line: 13, 1st char: 13, 'print' is a 'Reserved_word'.
Line: 13, 1st char: 18, '(' is a 'Symbol'.
Line: 13, 1st char: 19, 'c = ' is a 'String'.
Line: 13, 1st char: 26, '+' is an 'Operator'.
Line: 13, 1st char: 28, ' ' is an 'Operator'.
Line: 13, 1st char: 29, 'c' is an 'ID'.
Already Have!
Line: 13, 1st char: 30, ')' is a 'Symbol'.
Line: 13, 1st char: 31, ' ' is a 'Symbol'.
Line: 14, 1st char: 9, 'else' is a 'Reserved_word'.
Line: 15, 1st char: 13, 'print' is a 'Reserved_word'.
Line: 15, 1st char: 18, 'c' is a 'Symbol'.
Line: 15, 1st char: 19, 'c' is an 'ID'.
Already Have!
Line: 15, 1st char: 20, ')' is a 'Symbol'.
Line: 15, 1st char: 21, ' ' is a 'Symbol'.
Line: 16, 1st char: 9, 'print' is a 'Reserved_word'.
Line: 16, 1st char: 14, 'c' is a 'Symbol'.
Line: 16, 1st char: 15, 'Hello world' is a 'String'.
Line: 16, 1st char: 28, ')' is a 'Symbol'.
Line: 16, 1st char: 29, ' ' is a 'Symbol'.
Line: 18, 1st char: 5, 'j' is a 'Symbol'.
Line: 20, 1st char: 1, 'j' is a 'Symbol'.
The symbol table contains:
Test1
add
a
b
c
cangcan-virtual-machine:~/Desktop/Compiler$
```

./demo < Test3.java(這個我為了測試其他測資有改過，所以輸出可能會不一樣)

```
Player
Ubuntu 64-bit os - VMware Workstation 12 Player (Non-commercial use only)

cangcan-virtual-machine:~/Desktop/Compiler$ ./demo < Test3.java
Line: 2, 1st char: 1, "public" is a "Reserved_word".
Line: 2, 1st char: 8, "class" is a "Reserved_word".
Line: 2, 1st char: 14, "Test3" is an "ID".
Test3
Line: 2, 1st char: 20, "(" is a "Symbol".
Line: 3, 1st char: 5, "int" is a "Reserved_word".
Line: 3, 1st char: 9, "A" is an "ID".
A
Line: 3, 1st char: 10, ";" is a "Symbol".
Line: 4, 1st char: 5, "int" is a "Reserved_word".
Line: 4, 1st char: 9, "a" is an "ID".
a
Line: 5, 1st char: 5, "double" is a "Reserved_word".
Line: 5, 1st char: 12, "b" is an "ID".
b
Line: 5, 1st char: 13, ";" is a "Symbol".
Line: 6, 1st char: 5, "double" is a "Reserved_word".
Line: 6, 1st char: 12, "A" is an "ID".
Already Have!!
Line: 6, 1st char: 13, ";" is a "Symbol".
Line: 8, 1st char: 5, "public" is a "Reserved_word".
Line: 8, 1st char: 12, "Test3" is an "ID".
Already Have!!
Line: 8, 1st char: 17, "(" is a "Symbol".
Line: 8, 1st char: 18, ")" is a "Symbol".
Line: 8, 1st char: 20, "(" is a "Symbol".
Line: 9, 1st char: 9, "a" is an "ID".
Already Have!!
Line: 9, 1st char: 11, "=" is an "Operator".
Line: 9, 1st char: 13, "1" is an "int".
Line: 9, 1st char: 14, ";" is a "Symbol".
Line: 10, 1st char: 9, "A" is an "ID".
Already Have!!
Line: 10, 1st char: 11, "=" is an "Operator".
Line: 10, 1st char: 13, "2" is an "int".
Line: 10, 1st char: 14, ";" is a "Symbol".
Line: 11, 1st char: 9, "b" is an "ID".
Already Have!!
Line: 11, 1st char: 11, "=" is an "Operator".
Line: 11, 1st char: 13, "-1.25" is a "Float".
Line: 11, 1st char: 17, ";" is a "Symbol".
Line: 12, 1st char: 5, ")" is a "Symbol".
Line: 13, 1st char: 1, ")" is a "Symbol".
The symbol table contains:
Test3
A
a
b
cangcan-virtual-machine:~/Desktop/Compiler$
```