

1.Lex 版本：flex 2.6.4

2.作業平台：Ubuntu 20.04.2 LTS

3.執行方式：

- make
- ./demo < Test1.java
- ./demo < Test2.java
- ./demo < Test3.java

4.如何處理這份規格書上的問題：

- 首先先利用正則表達式讓 scanner 可以正確的抓到每個 token，
且對應到正確的型態，並讓該 token 的行數與 char 位置顯示正確
- 再利用正則表達式取出錯誤的型態 並顯示 error message
- 最後再來處理 symbol table 的問題

5.寫這作業所遇到的問題：

- 剛開始對正則表達式不熟
- 從網業上下載測試集後，直接./demo < Test1.java 會有錯誤。後來發現不是程式碼的問題，新建一個一模一樣的 java 檔，就能正常測試
- 因為助教的範例上沒有 error message 的範例，所以不太清楚要以怎樣的形式輸出
- 一開始想說用 if-else 的形式處理 error message，後來決的用正則表達式框出錯誤的類型就可以了
- 結尾忘記加分號的 error 想了很久

6.測試檔執行結果圖片：

-Test1.java

```
aki@aki-VirtualBox:~/下載/TestFile_Lab1_2021$ ./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".
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".
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".
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".
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".
Line: 4, 1st char: 18, "+" is an "operator".
Line: 4, 1st char: 20, "b" is an "ID".
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".
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".
Line: 10, 1st char: 15, "=" is an "operator".
Line: 10, 1st char: 17, "5" is an "integer".
Line: 10, 1st char: 18, ";" is a "symbol".
Line: 11, 1st char: 9, "c" is an "ID".
Line: 11, 1st char: 11, "=" is an "operator".
Line: 11, 1st char: 13, "add" is an "ID".
Line: 11, 1st char: 16, "(" is a "symbol".
Line: 11, 1st char: 17, "a" is an "ID".
Line: 11, 1st char: 18, "," is a "symbol".
Line: 11, 1st char: 20, "10" is an "integer".
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, "(" is a "symbol".
Line: 12, 1st char: 13, "c" is an "ID".
Line: 12, 1st char: 15, ">" is an "operator".
Line: 12, 1st char: 17, "10" is an "integer".
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: 20, ")" 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".
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, "(" is a "symbol".
Line: 15, 1st char: 19, "c" is an "ID".
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, "(" 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, "}" is a "symbol".
Line: 20, 1st char: 1, "}" is a "symbol".
```

The symbol table contains:

```
Test1
add
a
b
c
```

```
aki@aki-VirtualBox:~/下載/TestFile_Lab1_2021$
```

-Test2.java

```
aki@aki-VirtualBox:~/下载/TestFile_Lab1_2021$ ./demo < Test2.java
Line: 1, 1st char: 1, "// this is a comment // line */ /* with /* delimiters */
before the end" is a "comment".
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".
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: 11, "=" is an "operator".
Line: 4, 1st char: 13, "-100" is an "integer".
Line: 4, 1st char: 17, ";" 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, "12.25e+6" 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, "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: 8, 1st char: 1, "/* this is a comment // line with some /* and
// delimiters */" is a "comment".
Line: 10, 1st char: 5, "}" is a "symbol".
Line: 11, 1st char: 1, "}" is a "symbol".
```

The symbol table contains:

Test2
i
d

```
aki@aki-VirtualBox:~/下载/TestFile_Lab1_2021$
```

-Test3.java

```
aki@aki-VirtualBox:~/下載/TestFile_Lab1_2021$ ./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".
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".
Line: 3, 1st char: 10, ";" is a "symbol".
Line: 4, 1st char: 5, "int" is a "reserved word".
Error: forget ';' after a
Line: 5, 1st char: 5, "double" is a "reserved word".
Line: 5, 1st char: 12, "b" is an "ID".
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".
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".
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".
Line: 9, 1st char: 11, "=" is an "operator".
Line: 9, 1st char: 13, "1" is an "integer".
Line: 9, 1st char: 14, ";" is a "symbol".
Line: 10, 1st char: 9, "A" is an "ID".
Line: 10, 1st char: 11, "=" is an "operator".
Line: 10, 1st char: 13, "2" is an "integer".
Line: 10, 1st char: 14, ";" is a "symbol".
```

```
Line: 11, 1st char: 9, "b" is an "ID".
Line: 11, 1st char: 11, "=" is an "operator".
Line: 11, 1st char: 13, "-1.2" 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
b
a
aki@aki-VirtualBox:~/下載/TestFile_Lab1_2021$
```