1. Lex,版本

```
2.6.4-6 - debconf (16 (null)) del
 c-compiler (0 (null)) libfl-dev
(0 (null)) flex:i386 (32 (null))
Provides:
2.6.4-6 - flex:i386 (= 2.6.4-6)
Reverse Provides:
flex:i386 2.6.4-6 (= 2.6.4-6)
```

```
libfl2,flex 2.5.39
libfl-dev,flex 2.5.39
libfl-dev,flex 2.6.4-6
```

2. 作業平台

Oracle VM VirtualBox

Unbuntu

```
operatingsystem@operatingsystem-VirtualBox:~$ lsb_release -a
No LSB modules are available.
Distributor ID: Ubuntu
Description:    Ubuntu 18.04.4 LTS
Release:        18.04
Codename:       bionic
```

3. 執行方式

首先寫好 makefile，在打好 lex 檔，而後在 terminal 打上以下指令:

make

./a.out < ?.pas   //?:取決於要測哪個檔案

4. 你/妳如何處理這份規格書上的問題

(1) reserved word

利用[Aa][Bb]...這樣的判斷去找出 reserved word.

(2) ID

包含 A~Z, 0-9, _與不合法開頭#, ^，將全部讀進來後再做開頭字元判斷。

(3) Symbols

分成下列三種型式做判斷:

; : .

( ) [ ] 利用 check quote 函示去判斷有沒有成對。

:= > < = == <= >= + - * /

(4) Integer

判斷分成 (+/-)1, 1(+/-)2, (+/-)1(+/-)2 的情形，最上面放 1(+/-)2 再來是(+/-)1(+/-)2，最後裁判段(+/-)1。

(5) Real

將.開頭的數字和後面是 0 設成 invaild，所以分開判斷.開頭和後面是 0 的 real。

(6) Quoted string

分開判斷' 和' '和 '，另外加入' ' 在一起的情況。

(7) Comment

利用 check quote 去判斷有沒有少(* 或 *)。

5. 你/妳寫這個作業所遇到的問題

(1)' You' ' ll see.' 的' ' 一直判斷不出來，' You' ' ll see.' 的' ' 讓 string s 在吃 yytext 的時候總是會少一個字元，因為原先設計是遇到第一個' 的時候去判斷下一個是不是' '，如果是的話，就是' You' ' ll see.' 這樣的 case，就要繼續吃下去，如果不是的話就要停下來，但是在遇到' ' 字元的時候少一個字元總是會出問題，最後利用 ddouble 這個參數去 trigger' ' 才成功。

(2) 1+2 的+,2 判斷，也想到用 operator 的方式，但是用法一直不對，最後去問助教才豁然開朗，用毒進來的 token 去切。

6. 所有測試檔執行出來的結果，存成圖片或文字檔

```
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 1.pas
Line: 1, 1st char: 1,"program" is a "reserved word".
Line: 1, 1st char: 9,"test" is a "ID".
Line: 1, 1st char: 13,";" is a "symbol".
Line: 2, 1st char: 1,"var" is a "reserved word".
Line: 3, 1st char: 3,"i" is a "ID".
Line: 3, 1st char: 5,":" is a "symbol".
Line: 3, 1st char: 7,"integer" is a "reserved word".
Line: 3, 1st char: 14,";" is a "symbol".
Line: 4, 1st char: 1,"begin" is a "reserved word".
Line: 5, 1st char: 3,"read" is a "reserved word".
Line: 5, 1st char: 7,"(" is a "symbol".
Line: 5, 1st char: 8,"i" is a "ID".
Line: 5, 1st char: 9,")" is a "symbol".
Line: 5, 1st char: 10,";" is a "symbol".
Line: 6, 1st char: 1,"end" is a "reserved word".
Line: 6, 1st char: 4,";" is a "symbol".
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 2.pas
Line: 1, 1st char: 1,"program" is a "reserved word".
Line: 1, 1st char: 9,"test" is a "ID".
Line: 1, 1st char: 13,";" is a "symbol".
Line: 2, 1st char: 1,"var" is a "reserved word".
Line: 3, 1st char: 3,"3i" is a "invalid ID".
Line: 3, 1st char: 6,":" is a "symbol".
Line: 3, 1st char: 8,"string" is a "reserved word".
Line: 3, 1st char: 14,";" is a "symbol".
Line: 4, 1st char: 1,"begin" is a "reserved word".
Line: 5, 1st char: 3,"3i" is a "invalid ID".
Line: 5, 1st char: 6,":=" is a "symbol".
Line: 5, 1st char: 9,"'ab" is a "invalid quoted strings".
Line: 5, 1st char: 12,";" is a "symbol".
Line: 6, 1st char: 1,"end" is a "reserved word".
Line: 6, 1st char: 4,";" is a "symbol".
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 3.pas
Line: 1, 1st char: 1,"(* comment 1
   comment 2 *)" is a "comment".
Line: 3, 1st char: 1,"program" is a "reserved word".
Line: 3, 1st char: 9,"test" is a "ID".
Line: 3, 1st char: 13,";" is a "symbol".
Line: 4, 1st char: 1,"var" is a "reserved word".
Line: 5, 1st char: 3,"i" is a "ID".
Line: 5, 1st char: 5,":" is a "symbol".
Line: 5, 1st char: 7,"integer" is a "reserved word".
Line: 5, 1st char: 14,";" is a "symbol".
Line: 6, 1st char: 1,"begin" is a "reserved word".
Line: 7, 1st char: 3,"read" is a "reserved word".
Line: 7, 1st char: 7,"(" is a "symbol".
```

```
Line: 7, 1st char: 7,"(" is a "symbol".
Line: 7, 1st char: 8,"i" is a "ID".
Line: 7, 1st char: 9,")" is a "symbol".
Line: 7, 1st char: 10,";" is a "symbol".
Line: 8, 1st char: 1,"end" is a "reserved word".
Line: 8, 1st char: 4,";" is a "symbol".
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 4.pas
Line: 1, 1st char: 1,"program" is a "reserved word".
Line: 1, 1st char: 9,"test" is a "ID".
Line: 1, 1st char: 13,";" is a "symbol".
Line: 2, 1st char: 1,"var" is a "reserved word".
Line: 3, 1st char: 3,"f" is a "ID".
Line: 3, 1st char: 5,":" is a "symbol".
Line: 3, 1st char: 7,"float" is a "reserved word".
Line: 3, 1st char: 12,";" is a "symbol".
Line: 4, 1st char: 1,"begin" is a "reserved word".
Line: 5, 1st char: 3,"f" is a "ID".
Line: 5, 1st char: 5,":=" is a "symbol".
Line: 5, 1st char: 8,"12.25e+6" is a "real".
Line: 5, 1st char: 16,";" is a "symbol".
Line: 6, 1st char: 1,"end" is a "reserved word".
Line: 6, 1st char: 4,";" is a "symbol".
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 5.pas
Line: 1, 1st char: 1,"(* a**b) *)" is a "comment".
Line: 2, 1st char: 1,"program" is a "reserved word".
Line: 2, 1st char: 9,"test" is a "ID".
Line: 2, 1st char: 13,";" is a "symbol".
Line: 3, 1st char: 1,"var" is a "reserved word".
Line: 4, 1st char: 3,"i" is a "ID".
Line: 4, 1st char: 5,":" is a "symbol".
Line: 4, 1st char: 7,"integer" is a "reserved word".
Line: 4, 1st char: 14,";" is a "symbol".
Line: 5, 1st char: 3,"_s" is a "ID".
Line: 5, 1st char: 5,"," is a "symbol".
Line: 5, 1st char: 7,"_s2" is a "ID".
Line: 5, 1st char: 10,"," is a "symbol".
Line: 5, 1st char: 12,"_s3" is a "ID".
Line: 5, 1st char: 15,"," is a "symbol".
Line: 5, 1st char: 17,"_s4" is a "ID".
Line: 5, 1st char: 20,"," is a "symbol".
Line: 5, 1st char: 22,"_s5" is a "ID".
Line: 5, 1st char: 26,":" is a "symbol".
Line: 5, 1st char: 28,"string" is a "reserved word".
Line: 5, 1st char: 34,";" is a "symbol".
Line: 6, 1st char: 1,"begin" is a "reserved word".
Line: 7, 1st char: 3,"i" is a "ID".
```

```
Line: 6, 1st char: 1,"begin" is a "reserved word".
Line: 7, 1st char: 3,"i" is a "ID".
Line: 7, 1st char: 5,":=" is a "symbol".
Line: 7, 1st char: 8,"-100" is a "integer".
Line: 7, 1st char: 12,";" is a "symbol".
Line: 8, 1st char: 3,"_s" is a "ID".
Line: 8, 1st char: 6,":=" is a "symbol".
Line: 8, 1st char: 9,"'db lab'" is a "quoted string".
Line: 8, 1st char: 17,";" is a "symbol".
Line: 9, 1st char: 3,"_s2" is a "ID".
Line: 9, 1st char: 7,":=" is a "symbol".
Line: 9, 1st char: 10,"'You'll see'" is a "quoted string".
Line: 9, 1st char: 22,";" is a "symbol".
Line: 10, 1st char: 3,"_s3" is a "ID".
Line: 10, 1st char: 7,":=" is a "symbol".
Line: 10, 1st char: 10,"''" is a "empty quoted string".
Line: 10, 1st char: 12,";" is a "symbol".
Line: 11, 1st char: 3,"_s4" is a "ID".
Line: 11, 1st char: 7,":=" is a "symbol".
Line: 11, 1st char: 10,"''''" is a "quoted string".
Line: 11, 1st char: 13,";" is a "symbol".
Line: 12, 1st char: 3,"_s5" is a "ID".
Line: 12, 1st char: 7,":=" is a "symbol".
Line: 12, 1st char: 10,"' '" is a "blank quoted string".
Line: 12, 1st char: 13,";" is a "symbol".
Line: 13, 1st char: 1,"end" is a "reserved word".
Line: 13, 1st char: 4,";" is a "symbol".
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 6.pas
Line: 1, 1st char: 1,"ProGram" is a "reserved word".
Line: 1, 1st char: 9,"test" is a "ID".
Line: 1, 1st char: 13,";" is a "symbol".
Line: 2, 1st char: 1,"var" is a "reserved word".
Line: 3, 1st char: 3,"#db" is a "invalid ID".
Line: 3, 1st char: 7,":" is a "symbol".
Line: 3, 1st char: 9,"float" is a "reserved word".
Line: 3, 1st char: 14,";" is a "symbol".
Line: 4, 1st char: 3,"_f2" is a "ID".
Line: 4, 1st char: 7,":" is a "symbol".
Line: 4, 1st char: 9,"float" is a "reserved word".
Line: 4, 1st char: 14,";" is a "symbol".
Line: 5, 1st char: 1,"begin" is a "reserved word".
Line: 6, 1st char: 3,"#db" is a "invalid ID".
Line: 6, 1st char: 7,":=" is a "symbol".
Line: 6, 1st char: 10,".1" is a "invalid real".
Line: 6, 1st char: 12,";" is a "symbol".
Line: 7, 1st char: 3,"_f2" is a "ID".
Line: 7, 1st char: 7,":=" is a "symbol".
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Line: 6, 1st char: 12,";" is a "symbol".
Line: 7, 1st char: 3,"_f2" is a "ID".
Line: 7, 1st char: 7,":=" is a "symbol".
Line: 7, 1st char: 10,"12.100" is a "invalid real".
Line: 7, 1st char: 16,";" is a "symbol".
Line: 8, 1st char: 1,"end" is a "reserved word".
Line: 8, 1st char: 4,";" is a "symbol".
```

```
operatingsystem@operatingsystem-VirtualBox:~/Desktop/compiler/B051010001_hw1$ ./a.out < 7.pas
Line: 1, 1st char: 1,"(* This line is a comment. *)" is a "comment".
Line: 2, 1st char: 1,"program" is a "reserved word".
Line: 2, 1st char: 9,"test" is a "ID".
Line: 2, 1st char: 13,";" is a "symbol".
Line: 3, 1st char: 1,"var" is a "reserved word".
Line: 4, 1st char: 3,"i" is a "ID".
Line: 4, 1st char: 5,":" is a "symbol".
Line: 4, 1st char: 7,"integer" is a "reserved word".
Line: 4, 1st char: 14,";" is a "symbol".
Line: 5, 1st char: 1,"begin" is a "reserved word".
Line: 6, 1st char: 3,"i" is a "ID".
Line: 6, 1st char: 5,":=" is a "symbol".
Line: 6, 1st char: 8,"1" is a "integer".
Line: 6, 1st char: 9,"+" is a "symbol".
Line: 6, 1st char: 10,"2" is a "integer".
Line: 6, 1st char: 11,";" is a "symbol".
Line: 7, 1st char: 1,"end" is a "reserved word".
Line: 7, 1st char: 4,";" is a "symbol".
```