1. **Lex :** 2.6.4 　**Yacc(bison)** :3.0.4
2. 作業平台: Ubuntu 18.04.5 LTS
3. 執行方式：(1)make (2)./calc < test[1-6].java
4. **你如何處理這份規格書上的問題**
   小修正一下上一次的 lex 拿來用，主要是把 symbolTab 移到.y 檔，然後.y 會去接從.l 傳過來的 TOKEN 來處理。而且這次還要將 class 和 function 拉出來分別做了兩個 table 來存。

5. **你寫這個作業所遇到的問題**
   語法不熟
   最後 test6 有一個 ARRAY 的部分，那邊卡滿久的一直不知道哪裡錯，但其實就另外加個就好了。
   makefile 怪怪的沒辦法分檔(.c&.h)之類的
   error recovery 那邊不是很懂，所以 error 部分弄最久

6. **所有測試檔執行出來的結果，存成圖片**

```
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test1.java
Line 1: /* Test file: Perfect test file
 * Compute sum = 1 + 2 + ... + n
 */
Line 4: class sigma {
Line 5:    // "final" should have const_expr
Line 6:    final int n = 10;
Line 7:    int sum, index;
Line 8:
Line 9:    main()
Line 10:    {
Line 11:      index = 0;
Line 12:      sum = 0;
Line 13:      while (index <= n)
Line 14:      {
Line 15:        sum = sum + index;
Line 16:        index = index + 1;
Line 17:      }
Line 18:      print(sum);
Line 19:    }
Line 20: }
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test2.java
Line 1: /*Test file: Duplicate declare variable in the same scope*/
Line 2: class Point
Line 3: {
Line 4:      static int counter ;
Line 5:      int x, y ;
Line 6:      /*Duplicate declare x*/
Line 7:      int x ;
> 'x' is a duplicate identifier.
Line 8:      void clear()
Line 9:      {
Line 10:        x = 0 ;
Line 11:        y = 0 ;
Line 12:    }
Line 13: }
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test3.java
```

```
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test3.java
Line 1: /*Test file of Syntax errer: Out of symbol.  But it can go through*/
Line 2: class Point {
Line 3:     int z;
Line 4: 1st char 12 has unexpected ID, expecting COMMA or SEMI
Line 4:     int x y ;
Line 5:     /*Need  ',' before y*/
Line 6:     float w;
Line 7: }
Line 8: class Test {
Line 9:     int d;
Line 10:     Point p = new Point()
Line 11:     /*Need ';' at EOL*/
Line 12: 1st char 8 has unexpected INT, expecting SEMI
Line 12:     int w,q;
Line 13: }
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test4.java
Line 1: /*Test file: Duplicate declaration in different scope and same scope*/
Line 2: class Point
Line 3: {
Line 4:         int x, y ;
Line 5:         int p;
Line 6:         boolean test()
Line 7:         {
Line 8:                 /*Another x, but in different scopes*/
Line 9:                 int x;
Line 10:                 /*Another x in the same scope*/
Line 11:                 char x;
> 'x' is a duplicate identifier.
Line 12:                 {
Line 13:                         boolean w;
Line 14:                 }
Line 15:                 /*Another w in the same scope*/
Line 16:                 int w;
Line 17:         }
Line 18: }
Line 19: class Test
Line 20: {
Line 21:         /*Another p, but in different scopes*/
Line 22:         Point p = new Point();
Line 23: }
```

```
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test5.java
Line 1: class test5{
Line 2:     int add(int a1, int a2){
Line 3:         return (a1 + a2);
Line 4:     }
Line 5:     void main() {
Line 6:         int x, y, z;
Line 7:         for(int i=0;i<2;i++){
Line 8:             if(i==0){
Line 9: //--------------ELSE WITHOUT IF
Line 10: 1st char 21 has unexpected ELSE
Line 10:                 else
Line 11:                     i = 1;
Line 12:             }
Line 13:             for(x = 0; x<5;x++){
Line 14:                 y++;
Line 15: //-------------FUNCTION CALL
Line 16:                 x = add(x,y);
Line 17:                 x = z(x,y);
Line 18:             }
Line 19:         }
Line 20:         print("x:"+x+"y:"+y);
Line 21: 1st char 33 has unexpected DSUB, expecting SEMI or ADD or SUB
Line 21:         z = ( x + y ) * 5 / 2 -- -y;
Line 22:     }
Line 23: }
Line 24:
Line 25: /* this is a comment // line// with some /* /*and
// delimiters */
```

```
can@can-virtual-machine:~/Desktop/Compiler2$ ./calc < test6.java
Line 1: class test6{
Line 2:     void sum(){
Line 3: //------NEVER USED
Line 4:         int sumxyz = x + y + z ;
> 'z' hasn't been declared yet.
Line 5:     }
Line 6:     void main() {
Line 7: //------ARRAY
Line 8:         int [] i= new int [1];
Line 9:         for(i[0] = 0; i[0]<5; i[0]++)
Line 10:             i[0]++;
Line 11:
Line 12: //------NEW CLASS
Line 13:         Point lowerLeft = new Point() ;
> 'Point' hasn't been declared yet.
Line 14:
Line 15: //------ERROR CONDITION
Line 16: 1st char 16 has unexpected MUL
Line 16:         while(**/a++){
Line 17:             print("error!!");
Line 18:         }
Line 19: //------CLASS DECLARE
Line 20:         class Point {
Line 21:             int x, y, z;
Line 22:         }
Line 23:     }
Line 24:
Line 25: }
can@can-virtual-machine:~/Desktop/Compiler2$
```