1. Lex 版本: flex 2.6.4

   Yacc版本: bison 3.0.4

2. 作業平台: Ubuntu 20.04.4

3. 執行方式:

   A. 編寫程式碼

   B. make all

   C. ./calc < 測試檔名

4. 你/妳如何處理這份規格書上的問題:

   A. 修改上次lex的檔案, 上次在string遇到一些問題, 因此修改起來有點麻煩, 後來就直接問上次作業滿分的同學了

   B. Lex的Rule要更改, 但同時要配合yacc的grammar, 看規格書的說明

   C. Error recovery 要透過function的處理才能判斷是什麼error

5. 你/妳寫這個作業所遇到的問題:

   語法不熟, 要花一些時間了解該如何使用, 在寫yacc的grammar時有點崩潰, 完全不知道怎麼下手, 大概研究了一周才稍微懂。

   另外在處理error的時候, 出現蠻多問題的, 真的需要耐心解決。還有將每一行印出來的時候, 遇到註解時卻無法判斷有幾行, 也是摸索很久才解決。

6. 所有測試檔執行出來的結果, 存成圖片

   Test1.java

```
→  hw2 ./calc < test1.java
Line 1: /* Test file: Perfect test file
Line 2:  * Compute sum = 1 + 2 + ... + n
Line 3:  */
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: }
Line 21:
```

Test2.java

```
→  hw2 ./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 ;
> is a duplicate identifier.
Line 8:     void clear()
Line 9:     {
Line 10:         x = 0 ;
Line 11:         y = 0 ;
Line 12:     }
Line 13: }
Line 14:
```

Test3.java

```
→  hw2 ./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:     int x y ;
Line 4, 1st char: 12, a syntax error
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, 1st char: 1, a syntax error
Line 11:     /*Need ';' at EOL*/
Line 12:     int w,q;
Line 13: }
Line 14:
```

Test4.java

```
→  hw2 ./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;
> 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: }
Line 24:
```

Test5.java

```
→  hw2 ./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:                 else
Line 10, 1st char: 21, a syntax error
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:         z = ( x + y ) * 5 / 2 -- -y;
Line 22:     }
Line 23: }
Line 24:
Line 25: /* this is a comment // line// with some /* /*and
Line 26: // delimiters */
Line 27:
```

Test6.java

```
→  hw2 ./calc < test6.java
Line 1: class test6{
Line 2:     void sum(){
Line 3: //------NEVER USED
Line 4:         int sumxyz = x + y + z ;
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() ;
Line 14:
Line 15: //------ERROR CONDITION
Line 16:         while(**/a++){
Line 16, 1st char: 16, a syntax error
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: }
Line 26:
```