

# Test Cases

Kai Wong

04/03/2018

## 1 Valid Test Cases

### 1.1 Simple 1

```
1      /* Simple test case */  
2      {}$
```

Results: Valid

### 1.2 Simple 2

```
1      /* Test case for print statement */  
2      {  
3          print("i love compilers")  
4      }$
```

Results: Valid

### 1.3 Regular

```
1      /* Test case for a 'regular' program*/  
2      {  
3          int a  
4          a = 1  
5          print(a)  
6          boolean b  
7          b = true  
8          print(b)  
9  
10         {  
11             int a  
12             a = 2  
13             print(a)  
14         }  
15  
16         {  
17             int a  
18             a = 3  
19             print(a)  
20         }  
21  
22         string s  
23         s = "stra"  
24         print(s)  
25  
26         s = "strb"  
27         print(s)  
28  
29         if (a != 5) {
```

```

30         print("true")
31     }
32
33     if (a == 5) {
34         print("false")
35     }
36 }$

```

Results: Valid

## 1.4 Multiple

```

1      /* Test case for multiple programs */
2      {
3          print("i love compilers")
4          int a
5          a = 2
6          string s
7          s = "ha"
8      }$
9
10     {
11         int b
12         b = 4
13         string s
14         s = "hey"
15     }$

```

Results: Valid

## 1.5 All Productions thx Tien

```

1      /* Test case for all productions - thx Tien */
2      {
3          /* Int Declaration */
4          int a
5          int b
6          string s
7          boolean z
8
9          z = true
10         s = "kai sucks"
11
12         a = 0
13         b = 0
14
15         /* While Loop */
16         while (a != 3) {
17             print(a)
18             while (b != 3) {
19                 print(b)
20                 b = 1 + b
21                 if (b == 2) {
22                     /* Print Statement */
23                     print("kai sucks"/* This will do nothing */)
24                 }
25             }
26
27             b = 0
28             a = 1 + a
29         }
30     }$

```

Results: Valid

## 1.6 Crazy One Liner (Lex Pass)

```
1      /* Test case for crazy one liner */
2      +${hellotruefalse!=====trueprinta=3b=0print("false true")whi33leiftruefalsestring!=
      stringintbooleanaa truewhileif{hi++++==}}/*aaahaha*/hahahahaha/*awao*/$
```

Results: Valid (for Lex)

## 1.7 Crazy One Liner Pt. 2 Thx Tien

```
1      /*Test case for all productions - thx Tien*/{/*IntDeclaration*/
      intaintbstringsbooleanzz=true="kai sucks"a=0b=0/*WhileLoop*/while(a!=3){print(a
      )while(b!=3){print(b)b=1+bif(b==2){/*PrintStatement*/print("kai sucks"/*
      Thiswillldonothing*/)}}b=0a=1+a}}$
```

Results: Valid

## 1.8 WhileStatement

```
1      /* Test case for WhileStatement */
2      {
3          string s
4          int a
5          a = 1
6          {
7              s = "hey there sexy"
8              int a
9              a = 2
10             print(a)
11         }
12         {
13             while (a != 5) {
14                 a = 1 + a
15                 print(a)
16             }
17             print(3 + a)
18             print(s)
19         }
20     } $
```

## 1.9 IfStatement

```
1      /* Test case for IfStatement */
2      {
3          int a
4          a = 1
5          if(1 == 1){
6              print("nums")
7          }
8          if(a == a){
9              print("ids")
10         }
11         if("hey" == "hey"){
12             print("strings")
13         }
14         if(true == (a == a)){
15             print("booleans")
16         }
17     } $
```

## 2 Warning Test Cases

### 2.1 Missing EOP

```
1      /* Missing EOP */
2      {
3          int b
4          b = 4
5          string s
6          s = "hey"
7      }
```

Results: WARNING: No EOP [\$] detected at end-of-file. Adding to end-of-file...

### 2.2 Semantic Warnings

```
1      /* has unused and undeclared variables */
2      {
3          int a
4          int b
5          a = 3
6          b = 4
7          {
8              string a
9              a = "hey"
10             print(a)
11             print(b)
12         }
13         print(b)
14         string s
15         {
16             boolean b
17             b = false
18         }
19         string r
20         r = "hey"
21         int d
22         print(d)
23     }$
```

Results:

WARNING: Variable [a] on line 2 col 4 has been initialized but is not used.

WARNING: Variable [s] on line 13 col 4 has been declared but is not initialized properly.

WARNING: Variable [r] on line 18 col 4 has been initialized but is not used.

WARNING: Variable [b] on line 15 col 8 has been initialized but is not used.

## 3 Lex Fail Programs

### 3.1 Alan

```
1      /* Provided By
2         - Compiler Tyrant
3         - Alan G Labouseur
4      */
5      {}$
6      {{{{{{}}}}}}$
7      {{{{{{}}}}}}$
8      {int @}$
```

Results: ERROR: Unrecognized or Invalid Token [ @ ] on line 8 col 5

### 3.2 Invalid String 1

```
1      /* Test case for placing $ in quotes */
2      {
3          print("i love com$pilers")
4          int a
5          a = 2
6          string s
7          s = "ha"
8          "
9      }$
```

Results: ERROR: Invalid character in String [ \$ ] on line 3 col 21

### 3.3 Invalid String 2

```
1      /* Test case for invalid characters in string */
2      {
3          string s
4          s = "cookies & cream"
5      }$
```

Results: ERROR: Invalid character in String [ & ] on line 4 col 17

### 3.4 Invalid String 3

```
1      /* Test case for placing \n in quotes */
2      {
3          "hey
4          there"
5      }$
```

Results: ERROR: Invalid character in String [ \n ] on line 3 col 8

### 3.5 Invalid String 4

```
1      /* Test case for missing ending quote */
2      int a
3      a = 4
4      string s
5      s = "hey there
```

Results: ERROR: Missing ending quote for String literal starting on line 5 col 4

### 3.6 Invalid Print

```
1      /* Test case for invalid print */
2      {
3          print("my name is 11")
4      }$
```

Results: ERROR: Invalid character in String [ 1 ] on line 3 col 22

### 3.7 Missing End Comment Brace

```
1      /* Test case for missing end comment brace */
2      {
3          print("my name is eleven")
4          /* hey i love compilers
5      }$
```

Results: ERROR: Missing ending comment brace (\*/) for comment starting on line 4 col 4

## 4 Parse Fail Programs

### 4.1 Invalid StatementList

```
1      /* Test case for invalid StatementList */
2      {
3          4 + 2
4      }$
```

Results: ERROR - Expecting [TRbrace], found [TDigit] on line 3

### 4.2 Invalid Expr

```
1      /* Test case for invalid Expr */
2      {
3          int a
4          a = a + 2
5      }$
```

Results: ERROR - Expecting [TRbrace], found [TDigit] on line 3

### 4.3 Invalid VarDecl

```
1      /* Test case for invalid VarDecl */
2      {
3          int 4
4      }$
```

Results: ERROR - Expecting [Id], found [TDigit] on line 3

### 4.4 Invalid Print Pt. 2

```
1      /* Test case for invalid Print pt. 2 */
2      {
3          print("$")
4      }$
```

Results: ERROR - Expecting [Expr], found [TEop] on line 3  
ERROR - Expecting [Block], found [TRparen] on line 3

### 4.5 Incomplete BooleanExpr

```
1      /* Test case for incomplete BooleanExpr */
2      {
3          s = "strb"
4          print(s)
5
6          if (a != ) {
7              print("true")
8          }
9      }$
```

Results: ERROR - Expecting [Expr], found [TRparen] on line 6

## 4.6 Incomplete IntExpr

```
1      /* Test case for incomplete IntExpr */
2      {
3          int a
4          a = 1 +
5          print(a)
6      }$
```

Results: ERROR - Expecting [Expr], found [TPrint] on line 5

## 5 Semantic Analysis Fail Programs

### 5.1 Undeclared Variable

```
1      /* Variables being used but not declared first */
2      {
3          int a
4          b = 4
5      }$
```

Results: ERROR: Variable [b] on line 4 col 12 has not been previously declared.

### 5.2 Duplicate Variable

```
1      /* Variables being declared again in same scope*/
2      {
3          int a
4          {
5              string a
6              a = "this is fine"
7          }
8          boolean a /* this is not fine" */
9      }$
```

Results: ERROR: Variable [a] on line 8 col 20 has already been declared in current scope at line 3 col 12

### 5.3 Type Mismatch

```
1      /* A variable's type is not compatible with its assignment*/
2      {
3          string s
4          s = 4 + 3
5      }$
```

Results: ERROR: The variable [s] declared on line 4 col 12 is of type string and does not match the assignment type of int

### 5.4 Incorrect Type Comparisons

```
1      /* Types do not match in Boolean comparison*/
2      {
3          if(4 == false){
4              print("this no good")
5          }
6          if(4 == "hey"){
7              print("int to string")
8          }
9          if(false != "hey"){
10             print("bool to string")

```

```

11         }
12         if(4 != 3){
13             print("int to int")
14         }
15     }$

```

Results: ERROR: The [Expression] on line 3 col 15 is of type int and is incompatibly compared to a type of boolean

## 5.5 Incorrect Integer Expression

```

1     /* A digit is added to something other than a digit */
2     {
3         int a
4         a = 4 + false
5     }$

```

Results: ERROR: The [Expression] on line 4 col 20 is of type boolean which cannot be added to digits of type int

## 5.6 Tien Test

```

1     /* Thx Tien. */
2     {
3         int a
4         a = 0
5         string z
6         z = "bond"
7         while (a != 9) {
8             if (a != 5) {
9                 print("bond")
10            }
11            {
12                a = 1 + a
13                string b
14                b = "james bond"
15                print(b)
16            }
17        }
18        /*Holy Hell This is Disgusting*/
19        boolean c
20        c = true
21        boolean d
22        d = (true == (true == false))
23        d = (a == b)
24        d = (1 == a)
25        d = (1 != 1)
26        d = ("string" == 1)
27        d = (a != "string")
28        d = ("string" != "string")
29        if (d == true) {
30            int c
31            c = 1 + d
32            if (c == 1) {
33                print("ugh")
34            }
35        }
36        while ("string" == a) {
37            while (1 == true) {
38                a = 1 + "string"
39            }
40        }
41    }$

```

Results: ERROR - Variable [b] on line 40 col 22 has not been previously declared.



## 5.7 Tien Boolean Hell

```
1      /* Thanks Tien. Assuming you get past Boolean Hell
2      - there is a boolean being compared to
3      - a string which will cause a type error */
4      {
5          int a
6          a = 4
7          boolean b
8          b = true
9          boolean c
10         string d
11         d = "there is no spoon"
12         c = (d != "there is a spoon")
13         if(c == (false != (b == (true == (a == 3+1))))) {
14             print((b != d))
15         }
16     }
```

Results: ERROR - The [Expression] on line 14 col 23 is of type boolean and is incompatibly compared to a type of string