

The following are the list of faults and corrections that were made in the program. The line numbers correspond to the code snippet line numbers in the CFG.PDF for the method

#### **print\_spec\_symbol()**

- Fault detected in line 2 (if (str.equals("{}")). Modified: if (str.equals(""))

#### **is\_identifier()**

- Fault detected in line 19. Added if (c == ',') {return true;}
- Faults detected in line 9 (return false) modified to return true
- Faults detected in lines 11(return true). Modified to return false.

#### **get\_token**

- Fault detected in line 63 if (id == 1). Modified to if (id == 2).

Added Statement: line 31, if(ch == '#') id = 3;

Added a block: line 70 if (ch == '#')

```
{ unget_char(ch,br);  
    return sb.toString(); }
```

Added a block: Line 75

if (id == 3) /\* if end character is " and is string \*/

```
{  
    if(ch == '\r')  
    {  
        unget_char(ch,br);  
        return sb.toString();  
    }  
    else  
    {  
        sb.append(ch);  
        return sb.toString();  
    }  
}
```

#### **is\_str\_constant()**

- Fault detected in line 9 (return true). Modified: return false.

#### **is\_token\_end**

- Fault detected in lines 7 (if (str\_com\_id == 1)). Modified to if (str\_com\_id == 2)
- Fault detected in 12 (if (str\_com\_id == 2)). Modified to if (str\_com\_id == 1)

Added a block at line 29: if(str\_com\_id == 3 || ch == '#')

```
{  
    return true;  
}
```

#### **is\_num\_constant()**

- Faults detected in lines 4 (i <= str.length()) Modified: i < str.length()
- Fault detected in line 5 (str.charAt(i+1)). Modified: str.charAt(i).

#### **is\_char\_constant()**

- Faults detected in line2 (str.length() > 2) and Character.isLetter(str.charAt(1)). Modified: str.length() == 2 && str.charAt(0) == '#' && Character.isLetter(str.charAt(1))

#### **Main()**

- Fault detected in line 4 ( fname = new String() ) modified to fname=sc.nextLine().trim();
- Fault detected in line 6 (fname = args[1]). Modified to fname = args[0];

Total: 13 bugs found.