

# Faults Detected and Corrections Report

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In this report I will list all the faults listed in the program under Printtokens.java that was found. To make sure all the faults were found and all the test cases work, another file named "FixedPrinttokens.java" was created. This new fixed file consisted of an exact copy of the program but with all the faults fixed. End to end testing was made, within the faulted program and the fixed program, after running all the tests on the fixed program the results were all tests passed with full coverage.

I will now list all the faults that were detected and all the corrections that were made in order to make this new version of a fixed program named "FixedPrinttokens".

| # | Line Number | Fault Detected                               | Correction   | Reasoning   |
|---|-------------|--|--|---|
| 1 | 308-320     | while (i <= str.length() && str.charAt(i+1)) | for (int i = 0; i < str.length(); i++) { if (!Character.isDigit(str.charAt(i))) return false; }  | Fixed array bounds checking and proper digit validation |
| 2 | 289-296     | if (str.length() > 2    str.charAt(0)=='#')  | if (str.length() != 2    str.charAt(0) != '#') return false; return Character.isLetter(str.charAt(1));   | Corrected character constant validation                 |
| 3 | 332-335     | return true;                                 | for (int i = 1; i < str.length(); i++) { if (str.charAt(i) == "") return true; } return false;   | Added proper closing quote check                        |
| 4 | 354-366     | return false; ...<br>return true;            | if (!Character.isLetter(str.charAt(0))) return false; for (int i = 1; i < str.length(); i++) { if (!Character.isLetterOrDigit(str.charAt(i))) return false; } return true; | Fixed identifier validation logic                       |
| 5 | 379-417     | Missing error handling                       | Added: System.out.print("error,\"\" + str + "\".\n"); at end   | Added proper error case handling                        |
| 6 | 354-366     | No keyword check                             | Added: if (is_keyword(str)) return false;  | Added keyword check in identifier validation            |

|    |         |                                   |  |                                |
|----|---------|-----------------------------------|--|--------------------------------|
| 7  | 379-417 | No null check                     | Added null char check: <code>ch=='\0'</code> in termination conditions | Added null character handling  |
| 8  | 354-366 | <code>if (fname == null)</code>   | <code>if (fname == null    fname.equals(""))</code>                    | Added empty string check       |
| 9  | 175-194 | <code>String fname = null;</code> | <code>String fname = "";</code>  | Changed default initialization |
| 10 | 466-467 | <code>System.exit(0);</code>      | <code>return;</code>   | Changed program termination    |
| 11 | 469-470 | No stream check                   | Added: <code>if(br == null) { return; }</code>                         | Added stream validation        |