CSE-4321- 900
Software Testing and Maintenance Project
Summary and Discussion

1. get_token

I.   [1,2,3,4]
      Input: BufferedReader br = ""
      Output: null

II.   [1,2,3,5,6,7,8,6,9,10]
      Input: BufferedReader br = "\t" or "\n" or "\r"
      Output: null

III. [1,2,3,5,6,9,11,12,13]
      Input: BufferedReader br = ")"
      Output: ")"

IV.   [1,2,3,5,6,9,11,12,14,15,16,18,19,20,21]
      Input: BufferedReader br = """"
      Output: """"

V.   [1,2,3,5,6,9,11,12,14,16,17,18,19,20,21]
      Input: BufferedReader br = ";"
      Output: ";"

VI.   [1,2,3,5,6,9,11,12,14,16,18,19,22,23,24,25,26,28,23,29,30,31]
      Input: BufferedReader br = "hello"
      Output: "hello"

VII. [1,2,3,5,6,9,11,12,14,16,18,19,22,23,24,25,26,27,29,32,33,34]
      Input: BufferedReader br = "hello["
      Output: "hello["

VIII. [1,2,3,5,6,9,11,12,14,16,18,19,22,23,29,32,35,36,38]
      Input: BufferedReader br = "hello"
      Output: "hello"

IX.   [1,2,3,5,6,9,11,12,14,16,18,19,22,23,29,32,35,36,37,38]
      Note: I removed the node 37, it would give the same result as the previous
      test case
      Input: BufferedReader br = "hello
      Output: "hello

X.   [1,2,3,5,6,9,11,12,14,16,18,19,22,23,29,32,35,39,40,41]
      Input: BufferedReader br = "hello;"

Output: "hello"

XI. [1,2,3,5,6,9,11,12,14,16,18,19,22,23,29,32,35,39,42]
Input: BufferedReader br = ";"hello"
Output: ";"

2. is_token_end

I. [1,2]
Input: int str_com_id = 0, int res = -1
Expected Output: true

II. [1,3,4,5]
Input: int str_com_id = 1, int res = 34
Expected Output: true

III. [1,3,4,6]
Input: int str_com_id = 1, int res = 65
Expected Output: false

IV. [1,3,7,8,9]
Input: int str_com_id = 2, int res = 13
Expected Output: true

V. [1,3,7,8,10]
Input: int str_com_id = 2, int res = 65
Expected Output: false

VI. [1,3,7,11,12]
Input: int str_com_id = 3, int res = 40
Expected Output: true

VII. [1,3,7,11,13,14]
Input: int str_com_id = 3, int res = 13
Expected Output: true

VIII. [1,3,7,11,13,15]
Input: int str_com_id = 3, int res = 65
Expected Output: false

3. is_keyword

I. [1,2]
Input: String str = "and"
Expected Output: true
Actual Output: true

    II.   [1,3]
        Input: String str = "nor"
        Expected Output: false
        Actual Output: false

4. is_num_constant

    I.   [1,7]
        Input: String str = "ok"
        Expected Output: false
        Actual Output: false

    II.   [1,2,3,4,2,6]
      Input: String str = "1ok"
        Expected Output: false
        Actual Output: false

    III.   [1,2,3,5]
        Input: String str = "123"
        Expected Output: true
        Actual Output: true

5. is_str_constant

    I.   [1,7]
        Input: String str = "and"
        Expected Output: false
        Actual Output: false

    II.   [1,2,3,5,2,6]
        Input: String str = """"""
        Expected Output: true
        Actual Output: true

    III.   [1,2,3,4]
        Input: String str = ""hello"
        Expected Output: false
        Actual Output: true

6. is_identifier

    I.   [1,7]
        Input: String str = "123"
        Expected Output: false
        Actual Output: true

    II.   [1,2,3,4,2,6]
Input: String str = "a1b3"
Expected Output: true
Actual Output: false

    III.   [1,2,3,5]
Input: String str = "aa@#"
Expected Output: false
Actual Output: false

7. Main

    I.   [1,3,5]
Input: Main arguments should have 2 or more arguments. Example: main ("src/main_test.txt", "another_argument")
Expected Output: "Error! Please give the token stream\n"

    II.   [1,3,4,6,7,8,9,10,11,9,12]
Input: ;abc
Expected Output: "comment,\";abc\".\n"

    III.   [1,2,6,7,8,9,12]
Input: Main argument should have 1 argument that has the location of file. Example: main("src/main_test.txt")
Expected Output:
        "error,\"/hello\".\n"
        + "identifier,\"world\".\n"
        + "rsquare.\n"
        + "bquote.\n"
        + "quote.\n"

8. is_char_constant

    I.   [1,2]
Input: #a
Expected Output: true
Actual Output: false

    II.   [1,3]
Input: #ab
Expected Output: false
Actual Output: true

9. End to end coverage
    i.   [1,3,5]

Input- String [ ] args = ["src/end_to_end_test.txt", "too many arguments"]
Output- "Error! Please give the token stream."

ii. [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9 -> print_token [1, 2 -> token_type [1 -> is_keyword [1, 2], 2], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3 , 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

iii. [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9 -> print_token [1, 2 -> token_type [1 -> is_keyword [1, 2], 3 -> is_spec_symbol [1, 3, 5, 7, 8], 4], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

iv. [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2, 4], 4], 8 -> get_token [1,2 -> get_char [1, 2], 3, 4], 9 -> print_token [1, 2 -> token_type [1 -> is_keyword [1, 3], 3 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13], 5 -> is_identifer [1, 2, 3, 5], 7 -> is_num_constant [1, 2, 6], 8], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

v.   [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2, 4], 4], 8 -> get_token [1, 2] -> get_char [1, 2], 3, 4], 9 -> print_token [1, 2 -> token_type [1 -> is_keyword [1, 3], 3 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13], 5 -> is_identifer [1, 7], 6], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

vi. [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9 -> print_token [1, 2 -> token_type [1 -> is_keyword [1, 3], 3 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13], 5 -> is_identifer [1, 2, 3, 4, 2, 6], 7 -> is_num_constant [1, 2, 3, 5], 8 -> is_str_constant [1, 7], 11 -> 11 -> is_char_constant [1, 2], 12], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 7-> get_char [1, 2], 8, 6, 9, 10], 9, 12]

vii. [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 4] ,9 -> print_token[1, 2 -> token_type [1 -> is_keyword [1, 3], 3 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13], 5 -> is_identifer [1, 2, 3, 4, 2, 6], 7 -> is_num_constant [1, 7], 8 -> is_str_constant [1, 2, 3, 5, 2, 6], 11 -> is_char_constant [1, 3], 13 -> is_comment [1, 2], 14], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

viii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 2, open_character_stream [1, 2, 4],
4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9 -> print_token [1,2 ->
token_type [1 -> is_keyword [1, 3], 3 -> is_spec_symbol [1, 3, 5, 7, 9, 11,
13], 5 -> is_identifer [1, 2, 3, 4, 2, 6], 7 -> is_num_constant [1, 2, 3, 5], 8 ->
is_str_constant [1, 2, 3, 5, 2, 6], 11 -> is_char_constant [1, 3],13 ->
is_comment [1, 3], 15], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token [1,
2 -> get_char [1, 2], 3, 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

ix.   [1, 3, 4, 6, 7 -> open_token_stream [1, 2 -> open_character_stream [1, 2,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 4] ,9 -> print_token [1, 2 ->
token_type [1 -> is_keyword [1, 3], 3 -> is_spec_symbol [1, 3, 5, 7, 9, 11,
13], 5 -> is_identifer [1, 2, 3, 4, 2, 6], 7 -> is_num_constant [1, 2, 3, 5], 8 ->
is_str_constant [1, 2, 3, 4], 10], 3, 4, 5, 7, 9, 11, 13, 15], 10, 11 -> get_token
[1, 2 -> get_char [1, 2], 3, 5, 6, 7 -> get_char [1, 2], 8, 6, 9, 10], 9, 12]

x.   [1, 2, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4],
4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11,12 ->
is_spec_symbol [1, 2], 13], 9, 12]

xi.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 ->
is_spec_symbol [1, 3, 5, 7, 9, 10], 13], 9,12]

xii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6,9 ,11, 12 ->
is_spec_symbol [1, 3, 5, 7, 9, 11, 12], 13], 9, 12]

xiii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1 , 3,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 ->
is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 14], 13], 9, 12]

xiv.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 ->
is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 15, 16, 17, 18, 19, 20 ->
unget_char [1, 2], 21], 9, 12]

xv.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 ->
is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 ->
is_token_end [1, 2], 24, 25 -> get_char [1, 2], 26, 28, 23, 29, 30 ->
unget_char [1, 2], 31], 9, 12]

xvi.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3,
4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 ->
is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 ->

is_token_end [1, 3, 4, 5], 24, 25 -> get_char [1, 2], 26, 27, 29, 32 -> is_spec_symbol [1, 3, 4], 33 -> unget_char [1, 2], 34], 9, 12]

xvii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 3, 7, 8, 9], 24, 25 -> get_char [1, 2], 26, 27, 29, 32 -> is_spec_symbol [1, 3, 4], 33 -> unget_char [1, 2], 34], 9, 12]

xviii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 6],14, 16, 18, 19, 22, 23 -> is_token_end [1, 3, 7, 11 -> is_spec_symbol [1, 5, 6], 12], 24, 25 -> get_char [1, 2], 26, 27, 29, 32 -> is_spec_symbol [1, 3, 4], 33 -> unget_char [1, 2], 34], 9, 12]

xix.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11,12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 3, 4, 6], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 36, 38], 9, 12]

xx.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 3, 7, 8, 10], 29, 32 ->is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 36, 37, 38], 9, 12]

xxi.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 3, 7, 11 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 14], 13, 15], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 42], 9, 12]

xxii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token[1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 2], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 40 -> unget_char [1, 2], 41], 9 -> print_token [1, 2, 3, 5, 7, 8 -> print_spec_symbol [1, 2], 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9, 12]

xxiii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 2], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 40 -> unget_char [1, 2], 41], 9 -> print_token [1, 2, 3, 5, 7, 8 ->

print_spec_symbol [1, 3, 4], 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9, 12]

xxiv.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 2], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 40 -> unget_char [1, 2], 41], 9 -> print_token [1, 2, 3, 5, 7, 8 -> print_spec_symbol [1, 3, 5, 6], 9, 11, 13, 15], 10, 11 -> get_token [1 ,2 -> get_char [1, 2], 3, 4], 9, 12]

xxv.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 2], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 40 -> unget_char [1, 2], 41], 9 -> print_token [1, 2, 3, 5, 7, 8 -> print_spec_symbol [1, 3, 5, 7, 8], 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9, 12]

xxvi.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 2], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 40 -> unget_char [1, 2], 41], 9 -> print_token [1, 2, 3, 5, 7, 8 -> print_spec_symbol [1 , 3, 5, 7, 9, 10], 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9, 12]

xxvii.   [1, 3, 4, 6, 7 -> open_token_stream [1, 3 -> open_character_stream [1, 3, 4], 4], 8 -> get_token [1, 2 -> get_char [1, 2], 3, 5, 6, 9, 11, 12 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 14, 16, 18, 19, 22, 23 -> is_token_end [1, 2], 29, 32 -> is_spec_symbol [1, 3, 5, 7, 9, 11, 13, 15], 35, 39, 40 -> unget_char [1, 2], 41], 9 -> print_token [1, 2, 3, 5, 7, 8 -> print_spec_symbol [1, 3, 5, 7, 9, 11, 12], 9, 11, 13, 15], 10, 11 -> get_token [1, 2 -> get_char [1, 2], 3, 4], 9, 12]

Input for the tests is present in a end_to_end_file.txt file.
The output for these test paths would be-

```
        "keyword,\"and\".\n"

    +   "keyword,\"or\".\n"

    +   "keyword,\"if\".\n"

    +   "keyword,\"xor\".\n"
```

```
+ "keyword,\"lambda\".\n"
+ "keyword,\"=>\".\n"
+ "identifier,\"nand\".\n"
+ "lsquare.\n"
+ "string,\"123\".\n"
+ "rsquare.\n"
+ "error,\"'\".\n"
+ "bquote.\n"
+ "string,\"\".\n"
+ "string,\")\".\n"
+ "identifier,\"a12\".\n"
+ "error,\"a12\\0\".\n"
+ "identifier,\"a1b3\".\n"
+ "error,\"aa@#\".\n"
+ "error,\"12a\".\n"
+ "numeric,123.\n"
+ "string,\"123\\0\".\n"
+ "string,\"Hello\".\n"
+ "string,\"world\\0\".\n"
+ "error,\"\"Wow\".\n"
+ "character,\"a\".\n"
+ "error,\"#1\".\n"
+ "error,\"#abc\".\n"
+ "comment,\";hello\".\n"
+ "error,\"/hello\".\n"
+ "error,\"“hello\".\n"
+ "comment,\";”\".\n"
```

```
                    + "error,\"""\".\n"

                    + "comment,\";"hello"\".\n"

                    + "string,\";\".\n"

                    + "string,\"hello[\".\n"

                    + "comment,\";hello\\n\".\n"

                    + "comment,\";hello\\r\".\n"

                    + "comment,\";hello\\t\".\n"

                    + "lparen.\n"

                    + "string,\"hello\".\n"

                    + "rparen.\n
```