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White Box Testing

Java Program to replace lower-case characters with upper-case and vice-versa

Algorithm:

Here's the algorithm for converting lowercase characters to uppercase and uppercase characters to lowercase in a user input string:

- **Start:** Begin the algorithm.
- **Input:** Ask the user to input a word or sentence.
- **Read Input:** Read the input string from the user.
- **Initialize Variables:** Create a new string variable newStr to store the converted string.
- **Loop through Input String:** For each character in the input string:

If the character is a lowercase letter, convert it to uppercase and append it to newStr.

If the character is an uppercase letter, convert it to lowercase and append it to newStr.

If the character is not a letter, append it to newStr without any changes.

- **Output Result**: Print or display the converted string newStr.
- **End:** End the algorithm.

- Code:

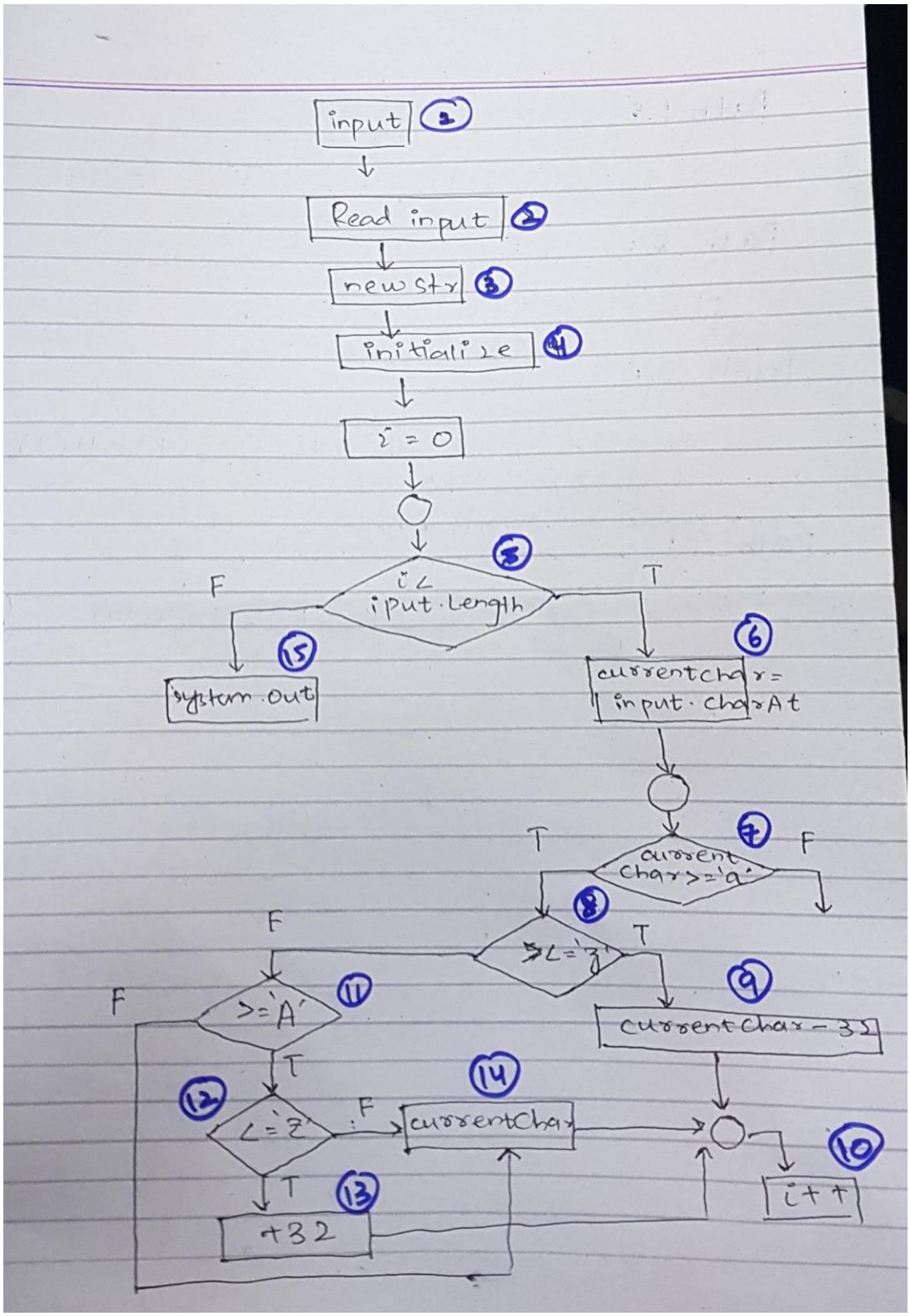
```
public class Characterconverter {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(source: System.in);

        System.out.println(x: "Enter a word or sentence:");
        String input = scanner.nextLine();

        StringBuffer newStr = new StringBuffer();

        for (int i = 0; i < input.length(); i++) {
            char currentChar = input.charAt(index: i);
            if (currentChar >= 'a' && currentChar <= 'z') {
                // Convert lowercase to uppercase by subtracting 32 from ASCII value
                newStr.append((char) (currentChar - 32));
            } else if (currentChar >= 'A' && currentChar <= 'Z') {
                // Convert uppercase to lowercase by adding 32 to ASCII value
                newStr.append((char) (currentChar + 32));
            } else {
                // Append non-letter characters as is
                newStr.append(c: currentChar);
            }
        }

        System.out.println("Converted: " + newStr.toString());

        scanner.close();
    }
}
```

```
Enter a word or sentence:
so#FIa
Converted: SO#fiA
------------------------------
BUILD SUCCESS
------------------------------
```

```
Enter a word or sentence:
sOfIa
Converted: SoFiA
```

```
--- exec:3.1.0:exec (default-cli) @ characterconverter ---
Enter a word or sentence:
ComsAts UniverSIty IslamBAD, AbboTTabad CampUS
Converted: cOMSaTS uNIVERsiTY iSLAMbad, aBBOttABAD cAMPus
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
```

- Control Flow Graph:



- ## Paths:

Path 1: 1-2-3-4-5(T)-6-7(T)-8(T)-9-10

Path 2: 1-2-3-4-5(F)-15

Path 3: 1-2-3-4-5(T)-6-7(T)-8(F)-11(T)-12(T)-13-10

Path 4: 1-2-3-4-5(T)-6-7(F)-11(F)-14-10

- ## Test Cases:

Test ID	Description	Test Data	Actual Result	Expected Result	Verdict
1	Lowercase to Uppercase	Input: "Hello World"	hELLO wORLD	hELLO wORLD	Pass
2	No letters	Input: "12345"	12345	12345	Pass
3	Special characters	Input: "!@#$%"	!@#$%	!@#$%	Pass
4	Uppercase to Lowercase	Input: "AbCdEfG"	aBcDeFg	aBcDeFg	Pass
5	Lowercase to Uppercase	Input: "aBcDeFg"	AbCdEfG	AbCdEfG	Pass
6	Mixed case	Input: "Java Programming"	jAVA pROGRAMMING	jAVA pROGRAMMING	Pass
7	Mixed case	Input: "UPPER lower"	upper LOWER	upper LOWER	Pass
8	Mixed case and special characters	Input: "123abc!@#"	123ABC!@#	123ABC!@#	Pass
9	Mixed case	Input: "HeLlO"	hElLo	hElLo	Pass
10	Mixed case	Input: "the QUICK brown FOX"	THE quick BROWN fox	THE quick BROWN fox	Pass