Convert String to Upper Case.

This question is not frequently asked in interviews but it is good learning exercise to implement the solution. Also, I would like to remind that we are not supposed to use toUpperCase() method of String API.

We can leverage the concept of ASCII.

Example:

A-65, B-66, .., Z=90

a-97, b-98, .. ,z=122

Link for ASCII table, click [here](http://www.asciitable.com/) .

You can generate ASCII table using simple program.

**for** (**int** i = 1; i <= 256; i++) {

System.***out***.println(i+" "+(**char**)i);

}

Now we have ASCII for all characters with us. Now a simple idea to convert a string to lower case is to replace the old ASCII with new ASCII value.

For example:

A is 65 and a is 97.

Now we have input as “a”.

Subtract 97 and add 65 to the character we are working on so now the value is 65. And 65 is ASCII for “A”.

Let us try another example.

“D” is 68 and d is 100.

100-97 = 3

Add 65 to the difference i.e 65 + 3 = 68

Subtract 97 and add 65 to the character we are working on so now the value is 68. And 68 is ASCII for “d”.

Well we now have our solution. Also one more thing we do not touch any other characters whose ASCII is < 97 and > 122. We leave them alone.

Let us design the test cases for this problem.

|  |  |
| --- | --- |
| Input | Output |
| null | null |
| “a” | “A” |
| “A” | “A” |
| “laptop” | “LAPTOP” |
| “LAPTOP” | “LAPTOP” |
| “password@111” | “PASSWORD@111” |
| “PASSWORD@111” | “PASSWORD @111” |
| “password@111” | “PASSWORD @111” |

Test Cases are as follows:

**package** strings;

**import** org.junit.Assert;

**import** org.junit.Test;

**public** **class** StringToUpperCaseTest {

@Test

**public** **void** testStringToUpperForNull() {

Assert.*assertEquals*(**null**, StringToUpperCase.*toUpperCase*(**null**));

}

@Test

**public** **void** testStringToUpperForSingleLengthLowerCase() {

Assert.*assertEquals*("A", StringToUpperCase.*toUpperCase*("a"));

}

@Test

**public** **void** testStringToUpperSingleLengthUpperCase() {

Assert.*assertEquals*("A", StringToUpperCase.*toUpperCase*("A"));

}

@Test

**public** **void** testStringToUpperForLowerCase() {

Assert.*assertEquals*("LAPTOP", StringToUpperCase.*toUpperCase*("laptop"));

}

@Test

**public** **void** testStringToUpperForUpperCase() {

Assert.*assertEquals*("LAPTOP", StringToUpperCase.*toUpperCase*("LAPTOP"));

}

@Test

**public** **void** testStringToUpperAdditionalCharacterLowerCase() {

Assert.*assertEquals*("PASSWORD@111", StringToUpperCase.*toUpperCase*("password@111"));

}

@Test

**public** **void** testStringToUpperAdditionalCharacterUpperCase() {

Assert.*assertEquals*("PASSWORD@111", StringToUpperCase.*toUpperCase*("PASSWORD@111"));

}

@Test

**public** **void** testStringToUpperAdditionalCharacter() {

Assert.*assertEquals*("PASSWORD@111", StringToUpperCase.*toUpperCase*("passWoRD@111"));

}

}

Now let us write code:

Check for null.

/\*\*

\* If string is null then return null

\* \*/

**if** (str == **null**) {

**return** **null**;

}

Check for 0 length.

/\*\*

\* If the length of string is 0 then return it.

\* \*/

**else** **if** (str.length() == 0) {

**return** str;

}

Search for UPPER case letters and convert it to lower case.

**for** (**int** i = 0; i < str.length(); i++) {

/\*\*

\* We make this check so as to convert Lower case letters to upper case.

\* range for lower case is from 97 to 122.

\* \*/

**if** (str.charAt(i) >= 'a' && str.charAt(i) <= 'z'){

newStr += (**char**) (str.charAt(i) - 'a' + 'A');

}

**else**{

newStr += str.charAt(i);

}

}

Code for entire method is as follows.

**public** **static** String toUpperCase(String str) {

/\*\*

\* If string is null then return null

\* \*/

**if** (str == **null**) {

**return** **null**;

}

/\*\*

\* If the length of string is 0 then return it.

\* \*/

**else** **if** (str.length() == 0) {

**return** str;

}

/\*\*

\* If the length of string is 0 then return it.

\* \*/

String newStr = "";

**for** (**int** i = 0; i < str.length(); i++) {

/\*\*

\* We make this check so as to convert Lower case letters to upper case.

\* range for lower case is from 97 to 122.

\* \*/

**if** (str.charAt(i) >= 'a' && str.charAt(i) <= 'z'){

newStr += (**char**) (str.charAt(i) - 'a' + 'A');

}

**else**{

newStr += str.charAt(i);

}

}

**return** newStr;

}