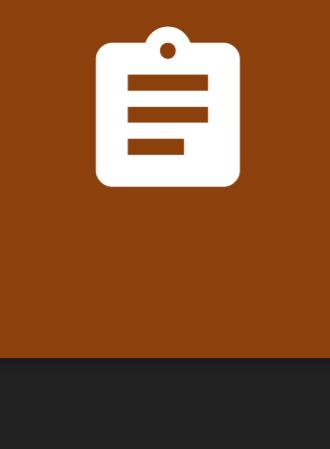


## ↑3.14 String access operations



Students:  
Section 3.15 is a part of 2 assignments: **CSC108 CH03.11-3.20 C3B**

This assignment's due date has passed. Activity will still be recorded, but will not count towards this assignment (unless the due date is changed). See [this article](#) for more info.

Includes: CA

Due: 02/25/2025, 11:59 PM EST

## 3.15 Character operations

Including the **cctype library** via `#include <cctype>` provides access to several functions for working with characters. ctype stands for character type. The first c indicates the library is originally from the C language.

Table 3.15.1: Character functions return values.

<b>isalpha(c)</b>	true if alphabetic: a-z or A-Z	<code>isalpha('x') // true isalpha('6') // false isalpha('!') // false</code>	<b>toupper(c)</b>	Uppercase version	<code>letter = toupper('a') // A letter = toupper('A') // A letter = toupper('3') // 3</code>
<b>isdigit(c)</b>	true if digit: 0-9.	<code>isdigit('x') // false isdigit('6') // true</code>	<b>tolower(c)</b>	Lowercase version	<code>letter = tolower('A') // a letter = tolower('a') // a letter = tolower('3') // 3</code>
<b>isspace(c)</b>	true if whitespace.	<code>isspace(' ') // true isspace('\n') // true isspace('x') // false</code>			

Note: Above, false is zero, and true is non-zero.

See <http://www.cplusplus.com/reference/cctype/> for a more complete list (applies to both C and C++).

[Feedback?](#)

Figure 3.15.1: State abbreviation capitalization.

```
#include <iostream>
#include <cctype>
using namespace std;

int main() {
    char let0;
    char let1;

    cout << "Enter a two-letter state abbreviation: ";
    cin >> let0;
    cin >> let1;

    if ( ! (isalpha(let0) && isalpha(let1)) ) {
        cout << "Error: Both are not letters." << endl;
    }
    else {
        let0 = toupper(let0);
        let1 = toupper(let1);
        cout << "Capitalized: " << let0 << let1 << endl;
    }

    return 0;
}
```

```
Enter a two-letter state abbreviation: az
Capitalized: AZ
...
Enter a two-letter state abbreviation: AZ
Capitalized: AZ
.
Enter a two-letter state abbreviation: Mn
Capitalized: MN
.
Enter a two-letter state abbreviation: 5x
Error: Both are not letters.
...
Enter a two-letter state abbreviation: A@
Error: Both are not letters.
```

[Feedback?](#)

PARTICIPATION ACTIVITY

3.15.1: Character functions.

To what value does each evaluate? userStr is "Hey #1".

- 1) `isalpha('7')`
  - True
  - False
- 2) `isalpha(userStr.at(0))`
  - True
  - False
- 3) `isspace(userStr.at(3))`
  - True
  - False
- 4) `isdigit(userStr.at(6))`
  - True
  - False
- 5) `toupper(userStr.at(1))` returns 'E'.
  - True
  - False
- 6) `tolower(userStr.at(2))` yields an error because 'y' is already lower case.
  - True
  - False
- 7) `tolower(userStr.at(6))` yields an error because '?' is not alphabetic.
  - True
  - False
- 8) After `tolower(userStr.at(0))`, userStr becomes "hey #1?"
  - True
  - False

[Feedback?](#)

CHALLENGE ACTIVITY

3.15.1: Character operations.

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[Start](#)

Variable `userString` is assigned with a 3-character string read from input. If `userString`'s second character is whitespace, output "The second character is whitespace." Otherwise, output "The second character is not whitespace." End each output with a newline.

Ex: If the input is `r -`, then the output is:

The second character is whitespace.

1    2    3

[Feedback?](#)

1    2    3

1    2    3

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1    2    3

1    2    3

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