Character Manipulation

. Check if character is alphanumeric
. Check if character is alphabetic
. Check if a character is blank
. Check if character is lowercase or uppercase
. Check if a character is a digit
. Turning a character to lowercase/uppercase using the
    std::tolower() and std::toupper functions

Documentation

https://en.cppreference.com/w/cpp/header/cctype

Standard library header <cctype>

This header was originally in the C standard library as **<ctype.h>**.

This header is part of the null-terminated byte strings library.

Functions

isalnum	checks if a character is alphanumeric (function)
isalpha	checks if a character is alphabetic (function)
islower	checks if a character is lowercase (function)
isupper	checks if a character is an uppercase character (function)
isdigit	checks if a character is a digit (function)
isxdigit	checks if a character is a hexadecimal character (function)
iscntrl	checks if a character is a control character (function)
isgraph	checks if a character is a graphical character (function)
isspace	checks if a character is a space character (function)
isblank (C++11)	checks if a character is a blank character (function)

Check if character is alphanumeric

```
//Check if character is alphanumeric
std::cout << std::endl;
std::cout << "std::isalnum : "<<std::endl;

std::cout << "C is alphanumeric : " << std::isalnum('C') << std::endl;
std::cout << "^ is alphanumeric : " << std::isalnum('^') << std::endl;

//Can use this as a test condition
char input_char {'*'};
if(std::isalnum(input_char)){
    std::cout << input_char << " is alhpanumeric." << std::endl;
}else{
    std::cout << input_char <<  " is not alphanumeric." << std::endl;
}
```

Check if character is alphanumeric

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std::cout << "C is alphanumeric : " << std::isalnum('C') << std::endl;
std::cout << "^ is alphanumeric : " << std::isalnum('^') << std::endl;

//Can use this as a test condition
char input_char {'*'};
if(std::isalnum(input_char)){
    std::cout << input_char << " is alhpanumeric." << std::endl;
}else{
    std::cout << input_char <<  " is not alphanumeric." << std::endl;
}
```

Check if character is alphabetic

```
//Check if character is alphabetic
std::cout << std::endl;
std::cout << "std::isalpha : "<<std::endl;
std::cout <<   "C is alphabetic : " << std::isalpha('C') << std::endl;
std::cout <<   "^ is alphabetic : " << std::isalpha('^') << std::endl;
std::cout <<   "7 is alphabetic : " << std::isalpha('7') << std::endl;
```

Check if character is blank

```
//Check if a character is blank
std::cout << std::endl;
std::cout << "std::isblank : "<<std::endl;
char message[] {"Hello there. How are you doing? The sun is shining."};
std::cout << "message : " << message << std::endl;

//Find and print blank index
int blank_count{};
for (size_t i{0} ; i < std::size(message); ++i){
    //std::cout << "Value : " << message[i] << std::endl;
    if(std::isblank(message[i])){
        std::cout << "Found a blank character at index : [" << i << "]" << std::endl;
        ++blank_count;
    }
}
std::cout << "In total we found " << blank_count << " blank characters."<< std::endl;
```

Check if character is lowercase/uppercase

```
//Check if character is lowercase or uppercase
std::cout << "std::islower and std::isupper : "<<std::endl;

std::cout << std::endl;
char thought[] {"The C++ Programming Language is one of the most used on the Planet"};
int lowercase_count{};
int upppercase_count{};

//Print original string for ease of comparison on the terminal
std::cout << "Original string  : " << thought << std::endl;

for( auto character : thought){
    if(std::islower(character)){
        std::cout <<" " << character;
        ++lowercase_count;
    }
    if(std::isupper(character)){
        ++upppercase_count;
    }
}
std::cout << std::endl;
std::cout << "Found " << lowercase_count << " lowercase characters and "
          <<upppercase_count << " uppercase characters."<<  std::endl;
```

Check if character is a digit

```
//Check if a character is a digit
std::cout << std::endl;
std::cout << "std::isdigit : "<<std::endl;

char statement[] {"Mr Hamilton owns 221 cows. That's a lot of cows! The kid exclamed."};
std::cout << "statement : " << statement << std::endl;

int digit_count{};

for(auto character : statement){
    if(std::isdigit(character)){
        std::cout << "Found digit : " << character << std::endl;
        ++digit_count;
    }
}
std::cout << "Found " << digit_count << " digits in the statement string" << std::endl;
```

Turn characters to lowercase/uppercase

```
//Turning a character to lowercase using the std::tolower() function
std::cout << std::endl;
std::cout << "std::tolwer and std::toupper: " << std::endl;
char original_str[] {"Home. The feeling of belonging"};
char dest_str[std::size(original_str)];

//Turn this to uppercase. Change the array in place
for(size_t i{}; i < std::size(original_str) ; ++i){
    dest_str[i] = std::toupper(original_str[i]);
}

std::cout << "Original string : " << original_str << std::endl;
std::cout << "Uppercase string : " << dest_str << std::endl;

//Turn this to lowercase. Change the array in place
for(size_t i{}; i < std::size(original_str) ; ++i){
    dest_str[i] = std::tolower(original_str[i]);
}

std::cout << "Lowercase string : " << dest_str << std::endl;
```