

How to handle words, fragments, and sentences in code.

CS 10A – INTRO TO STRINGS

Introduction

- When you want to store multiple characters in a single variable or even a whole sentence, use the variable type **string**, as in a string of characters.
- Important! String does not exist in C (more on this later in the semester). It's a convenience exclusive to more modern languages like C++.
- Because it's potential complexity, a library of functions is dedicated to manipulating and using strings in C++.
- The first character in any string has an index of 0.

Using Strings in Code

```
#include <iostream>
// #include <string>           // not needed, string functions already present in std
using namespace std;

string str0, str1, str2;      // declaring string variables, works like other variables

int main()
{
    cin >> str1;              // bring in a user-inputted string from the console
    cin >> str2;              // these two lines are the same as cin >> str1 >> str2;
                                // note that white spaces separates inputs
    str0 = str1 + str2;        // strings can be combined (term is concatenate)
    return 0;
}
```

Handling Multiple Simultaneous Inputs

Program

```
int x, y, z;  
string str0, str1, str2;  
int main()  
{  
    cin >> x >> y >> z;  
    cin >> str0 >> str1 >> str2;  
    // any kind of whitespace will separate  
    // your input into separate variables  
    cout << endl << y << endl << str0;  
    return 0;  
}
```

Console

```
➤ ./a.exe  
7 8 42  
Winter is coming  
  
8  
Winter
```

Introduction to Using Functions

- We'll go over functions in detail later in the semester. For now, you only need to know how to use them.
- A function in programming is pretty much the same as how it's defined in math: a process that does something.
- In math, IO is always necessary, but in programming, this doesn't always apply.
- Strings come with many functions from their library that allow us to manipulate or analyze them.
- To use a library function in C++ (and most object oriented programming languages like C# and Java), use a period.

Common String Functions

- **size()** or **length()** – returns the length of the string
- **clear()** – erases the content of the string variable
- **empty()** – checks if the string variable is empty, returns a 1 (true) if it is, 0 (false) otherwise
- **append(misc.)** – similar to using '+', but with custom options
- **compare(string)** – compares two strings
- **substr(int, int)** – generates a substring, basically extracting part of the whole string by specifying where to start and how many characters to pull from there

Utilizing (String) Library Functions

Program

```
string str0 = "Wreck-It Ralph";
int main()
{
    cout << str0.length() << endl;
    // Note that spaces and symbols count
    cout << str0.append(" 2") << endl;
    // append() also saves the new str to var
    cout << str0.substr(3, 7) << endl;
    // Begin at index 3, 7 characters long
    return 0;
}
```

Console

```
➤ ./a.exe
14
Wreck-It Ralph 2
ck-It R
```

Utilizing (String) Library Functions (cont.)

Program

```
string str0 = "Is mayonnaise ";
int main()
{
    string str1 = "an instrument?";
    int x = str0.length(), y = 5;
    // x is 14 right now, str0.length() changes later
    cout << str0.append(str1) << endl;
    // Raw values and variables are both allowed...
    cout << str0.substr(x, y) << endl;
    // As long as the data types are consistent
    return 0;
}
```

Console

```
➤ ./a.exe
Is mayonnaise an instrument?
an in
```