string(s) and char(s)

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Strings

- string is a class built into the C++ library.
- It is there to replace the original "cstrings" concept first developed for C.
- string has predefined functions contained within the class which we can use for our convenience to do string manipulations.

Declaring a String

- Model:

  string variable_name;

- string firstname = "Krishna";
- string lastname = "M";

Reading Into a String

Reading a word into a string

- To read in a person's first name, we can do the following:

```
string firstname;
cout << "Enter your first name: ";
cin >> firstname;
cout << "Your are " << firstname;
```

- You might note using cin like this only reads in one word at a time. Cin will read to the next whitespace.

Reading a line into a string

- To read in a person's full name, we can do the following:

```
string fullname;
cout << "Enter your full name: ";
getline( cin, fullname );
cout << "Your are " << fullname;
```

- Getline function will read in all the characters entered until it hits the newline character.

string as char array

Parts of the string

- We can think of string as an array of
- characters So a string is defined as follows…

  string name = "Krishna";
- Could be thought of as…

0	1	2	3	4	5	6
K	R	I	S	H	N	A

- Where…
- name[0]='K'; name[1]='R';

Replacing parts of the string

- Following the previous example, if we had the following code…

```
name[4] = 't';
name[5] = 'e';
```

- This would turn Krishna Kristen

String Manipulation

Identify the length of a string

- To identify the length of a string, we can use one of the following string class methods:

```
string str = "today is my birthday";
cout << "length: " << str.length();
//or
cout << "length: " << str.size();
```

Concatenate two strings together

- To concatenate two strings we can use + .

  string s1 = “Hello”;

  string s2 = “ World!”;

  string s3 = s1 + s2;

  cout << s3 << endl;

  This prints Hello World! to the screen.

- Programs designed with multi-lingual specifications use a language file to hold all the text. Text is load into a variable, and the variable is cout to the screen.

Inserting a string into a string

- The string library also allows us to insert some text into part of the string. We can use the insert function to do this.
- Model:
  - string_variable.insert(index_position, text_to_insert);
    - string_variable: a variable declared as a string type
    - insert: the insert function
    - index_position: the position you want the text to go this would push all other text back
    - text_to_insert: the text you want to insert in to this string

Inserting a into string (Example)

- To insert a string into another, we can do the following:

```
string str = "NY";
str.insert( 1, "ew " );

//insert into the end

str.insert( str.size(), "ork"  );

//note the location is 5
cout << str << endl;
```

Comparison on strings

- Comparison on the strings are done on individual character's code known as the ASCII code.
- Following comparisons operator are defined:

==	!=
true if str1 == str2	true if str1 != str2
>	>=
true if str1 > str2	true if str1 >= str2
<	<=
true if str1 > str2	true if str1 <= str2

- Because the above operators are defined, we can sort strings in C++ as we can sort numbers.

Other String Methods:

1. str.insert(pos, str2) Inserts str2 before the position pos of string str.
   Example:
   string str = “NY”;
   string str2 = “ew “;
   string str3 = “ork”;
   str.insert(1, str2);
   str.insert(5, str3);

2. str.find(str2) finds the str2 in string str.

```
Example:
string str = “There is a needle in the haystack.”;
string str2 = “needle”;
int found = str.find(str2);
if(found >= 0)
 cout << “needle is found at: “ << found << ‘\n’;
string str3 = “haystack”;
found = str.find(str3);
 cout <<”haystack is found at: “<<found<<’\n’;
```

3. str.rfind(key) finds the occurrence of string key in string str.
   string str = “A politician is an animal who can sit on a fence and yet keep both ears to the ground.”
   string key = ”ears”
   int found = str.rfind(key);
   cout << found << endl;

4. str.substr(pos, len)constructs a substring of length len, at position pos of the string str.

   string str = “A column of smoke rose thin and straight from the chimney.”;
   string str2 = str.substr(12, 5);
   cout << str2<< endl; // prints smoke.