

Ch 10. Strings and Things

Part 2: the string class

CS 2308
Fall 2011

Jill Seaman

Lecture 9

1

The string class

- string is a data type provided by the C++ library.
 - Specifically it is a class.
- string requires the <string> header file
- To define a string variable:
 - string name1;
 - name1 is a string object.
- Can assign a value to a string object:

```
string name1;  
name1 = "Steve Jobs";
```

2

Operations over string objects

- output using <<

```
string name1 = "Steve Jobs";  
cout << "Name " << name1 << endl;
```

- input using >>

```
string name1;  
cout << "Enter your name ";  
cin >> name1;
```

- input using getline (why?)

```
string name1;  
cout << "Enter your name ";  
getline (cin, name1);
```

3

More operations over string objects

- comparing string objects: < <= > >= == != (alphabetical order)

```
string string1 = "Hello ";  
string string2 = "World!";  
if (string1 < string2)  
    cout << "Hello comes before World" << endl;
```

- string objects can be compared to C-strings using relational operators

```
string string1;  
cout << "Enter a word: ";  
cin >> string1;  
if (string1 == "Hello")  
    cout << "You entered Hello." << endl;
```

4

More operations over string objects

- + concatenation of string objects:

```
string string1 = "Hello ";  
string string2 = "World!";  
cout << string1+string2 << endl;
```

Output: Hello World!

- [n] subscript notation, returns char at position n

```
string string1 = "Hello ";  
cout << string1[4] << endl;
```

Output: o

```
string1[0] = 'h';    //this works  
string1[6] = 's';    //this doesn't work (6>=length)
```

5

Other ways to initialize string objects

- ex:

```
string greeting = "Hello!";  
//Hello!
```

```
string name("william smith");  
//william smith
```

```
string name1(name);    //makes a copy  
//william smith
```

```
char cName[15] = "Grace Hopper";  
string name2 (cName, 5); //first 5 chars of C-str  
//Grace
```

```
string stars (20, '*'); //book has args backwards  
//*****
```

```
string partial(name, 0,4); //start: 0, length: 4  
//will
```

6

string class member functions

- string class has many member functions that operate over the string object
- `theString.length()` : returns length of string stored in `theString` (can also use `.size()`).

```
string theString = "Hello";  
cout << theString.length() << endl; //outputs 5
```

- `theString.append(str)`: appends `str` (string object or c-string) to the end of `theString`.

```
string theString = "Hello";  
theString.append(" World");  
cout << theString << endl; //outputs: Hello World
```

more string class member functions

- `theString.append(n, 'z')` : appends `n` copies of `char` to end of string

```
string theString = "Hello ";  
theString.append(2, 'z');  
cout << theString << endl; //outputs: Hello zz
```

- `theString.substr(x,n)`: returns a new string, copies `n` chars starting at position `x` from `theString`.

```
string string1 = "hello there";  
cout << string1.substr(6,3) << endl; //outputs: the
```

Exercise

- Write a function `countDigits` that takes a string as an argument and outputs the number of digits it contains.

9

Exercise

- Write a function `countDigits` that takes a string as an argument and outputs the number of digits it contains.

```
int countDigits (string p) {  
    int count = 0;  
    for (int i=0; i < p.length(); i++) {  
        if (isdigit(p[i]))  
            count++;  
    }  
    return count;  
}
```

10