ECE 71 – Engineering Computations in C

Professor Kriehn – Fall 2017

Code Due By: Midnight on Monday, November 13, 2017
Writeup Due By: Class on Tue/Wed, Nov 14/15, 2017

HOMEWORK #30 – Name Parser

Write a program that reads a person's name in the following format: first name, middle name or middle initial, and last name. The program should then output the name in the following format:

```
lastName, firstName middleInitial.
```

For example, the input:

```
Mary Tylor Moore
```

should produce the output:

```
Moore, Mary T.
```

The input:

```
Mary T. Moore
```

Should also produce the output:

```
Moore, Mary T.
```

Your program should work identically in both cases – meaning that it should place a period after the middle initial even if the input does not contain a period. Your program should also allow for users who give no middle name or middle initial. In that case, the output contains no initial. For example, the input:

```
Mary Moore
```

should produce the output

```
Moore, Mary
```

Specifications:
The program must use string objects via the string library, opposed to using C-based character arrays. You may use either the extraction operator `>>` or the `getline()` function, as appropriate. If you execute the program, the following information should be displayed:

```
~> main.o
Enter a name: Mary Tyler Moore
Abbreviated:  Moore, Mary T.
```

```
~> main.o
Enter a name: Mary T. Moore
Abbreviated:  Moore, Mary T.

~> main.o
Enter a name: Mary Moore
Abbreviated:  Moore, Mary
```

HOMEWORK #31 – XML Parser

The XML (eXtensible Markup Language) is a common format used to structure and store data on the Web. The address.xml file on the website provides a small sample XML file that could be used to store names in an address book. Either type the file in `nano` (with spaces/tabs appropriately), or copy it over to your project directory, and save it to a file named **`address.xml`**.

The sample file contains four contacts. The <> tag denotes the start of a field and the </> tag denotes the end of the field.

You are hosting a party in Palmdale, CA. Write a program that reads in the `address.xml` file and outputs the names and addresses of everyone in Palmdale. Your program should not output any of the tag information, just the address content.

Second, you would like to send an advertising flyer to everyone in zip codes 90210 through 90214. Next, modify your program to also output the names and addresses of everyone whose zip code falls within the specified range.

Specifications:
You may assume that each contact in the address file has the same structure and the same fields. However, your programming solution must be able to handle an input file with any number of contacts (not just 4) and should not assume that the fields within each contact are in the same order.

Use vector strings to solve the problem, along with member functions of the string library. Useful string functions and member functions may include `getline()`, `.find()`, `.size()`, `.substr()`, and `.push_back()` for vectors. I found it easiest to declare a separate string vectors to store the names, streets, cities, states, and zip codes.

Finally, use the following function prototypes:

```
// If a valid contact is found:

// getName() extracts the contact name from the file
// and pushes it to a string vector
void getName(ifstream &fin, vector<string> &name);

// getStreet() extracts the street and pushes it to a string vector
void getStreet(ifstream &fin, vector<string> &street);
```

```
// getCity() extracts the city and pushes it to a string vector
void getCity(ifstream &fin, vector<string> &city);

// getState() extracts the state and pushes it to a string vector
void getState(ifstream &fin, vector<string> &state);

// getZip() extracts the zip code and pushes it to a string vector
void getZip(ifstream &fin, vector<string> &zip);
```

When opening the file, the program should fail gracefully if the `address.xml` fails to open.

If you execute the program, the following information should be displayed:

```
~> main.o
Palmdale Addresses

     Cathy Pearl
     405 A St.
     Palmdale, CA  93352

     Wendy Jones
     982 Boundary Ave.
     Palmdale, CA  93354

Advertising to [90210-90214]

     George Clooney
     1042 El Camino Real
     Beverly Hills, CA  90214

     Paris Hilton
     200 S. Elm St.
     Beverly Hills, CA  90212
~>
```