William George
Report for Assignment 3
CS 161 Fall 2014
Week 3 October 15, 2014

Understanding:

This week is all about practicing strings, outputting random numbers, understanding the “for” loop and understanding input validation. The purpose of all the exercises are to help us understand what will be needed for the final project for this week, the random word generator. I’d like to break down each project individually.

strings.cpp

The purpose of strings was to learn the way to read a string word by word and to learn how to use a “for” loop with a string to check the contents. In this exercise we also learned how to ignore an input and how to evaluate both a word and a phrase to validate its contents.

name.cpp

The purpose of this program is to get a better understanding of how to evaluate a string input to parse the string into its individual words. For this project you can use cin or getline to get the input, then you must evaluate it so the output can either have a middle initial or not depending on whether the user inputs a middle name or not.

randNum.cpp

The purpose of this program is to understand the rand function and how to set said function so the pseudorandom numbers can appear to be more random. Also this exercise gives us more practice with the “for” loop.

loop.cpp

The purpose of this program is to compare the individual characters of two strings using a loop. There is an easier way to check and compare the components but at this point we are doing it the hard way with the loops. To compare the two words letter by letter we will likely need to use nested “for” loops.

randNum2.cpp

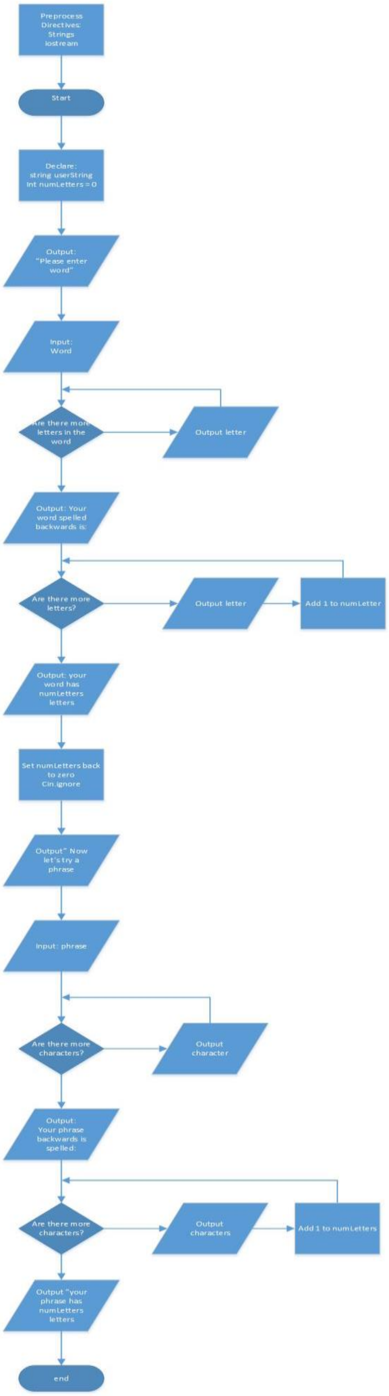
The second random number program is a bit more involved than the first. The program allows the user to input two values from which it will generate a range in which the random number will be chosen from. There is an input validation requirement part of this problem to start to understand how to validate user inputs so the program does what we want even if something wrong is entered by the user.

Week 3 Project – Word Guessing Game

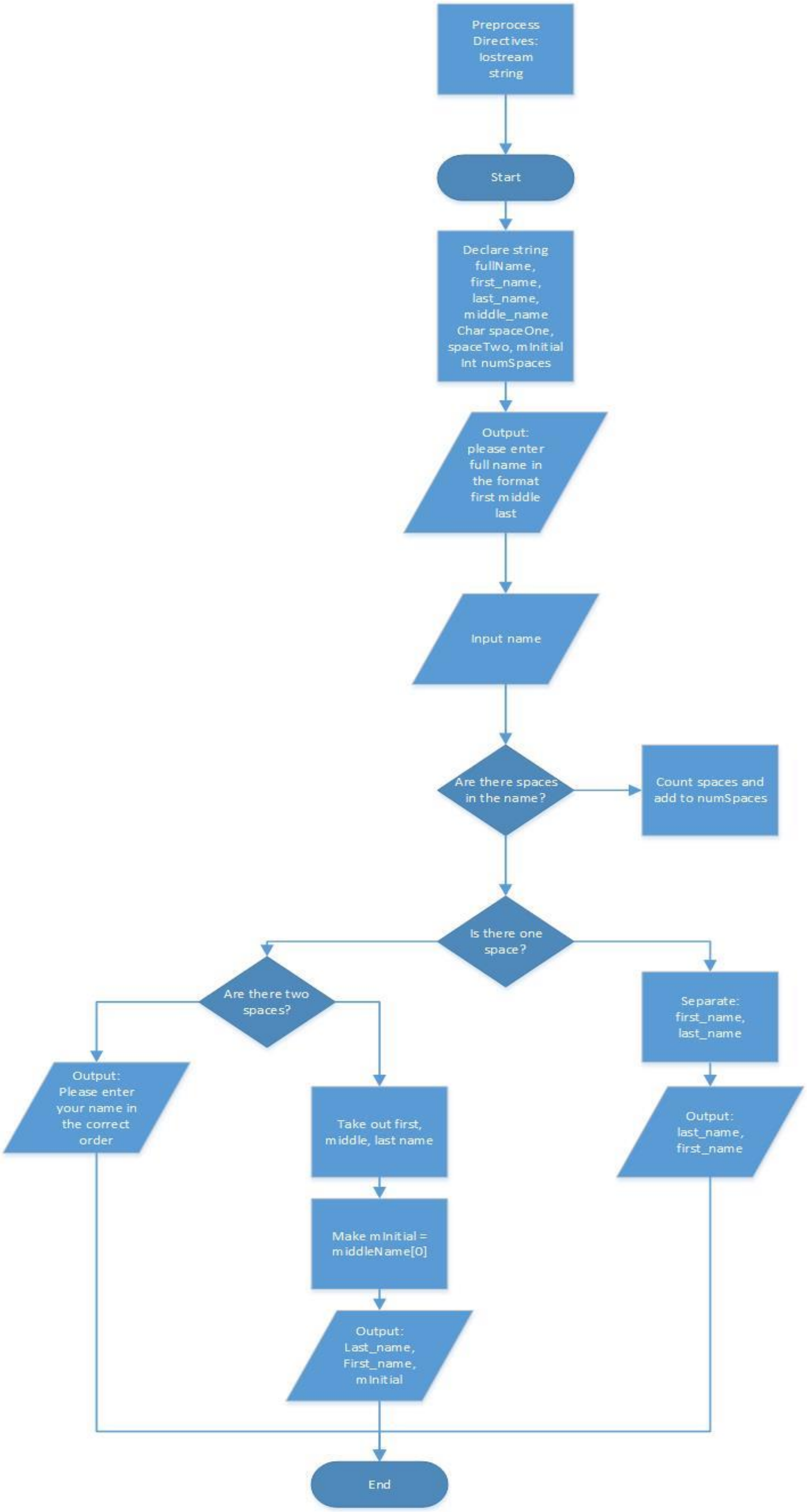
The week three project has two parts, the first part being a discussion or drawing of the game and the second being the actual planning of the project and its deliverables. The lessons we've learned in the previous assignments should be valuable in the creation of this program. I believe the purpose of this exercise this week is to show to plan for a larger project properly so that it fulfills the requirements set forth by a teacher and later on an employer.

Design

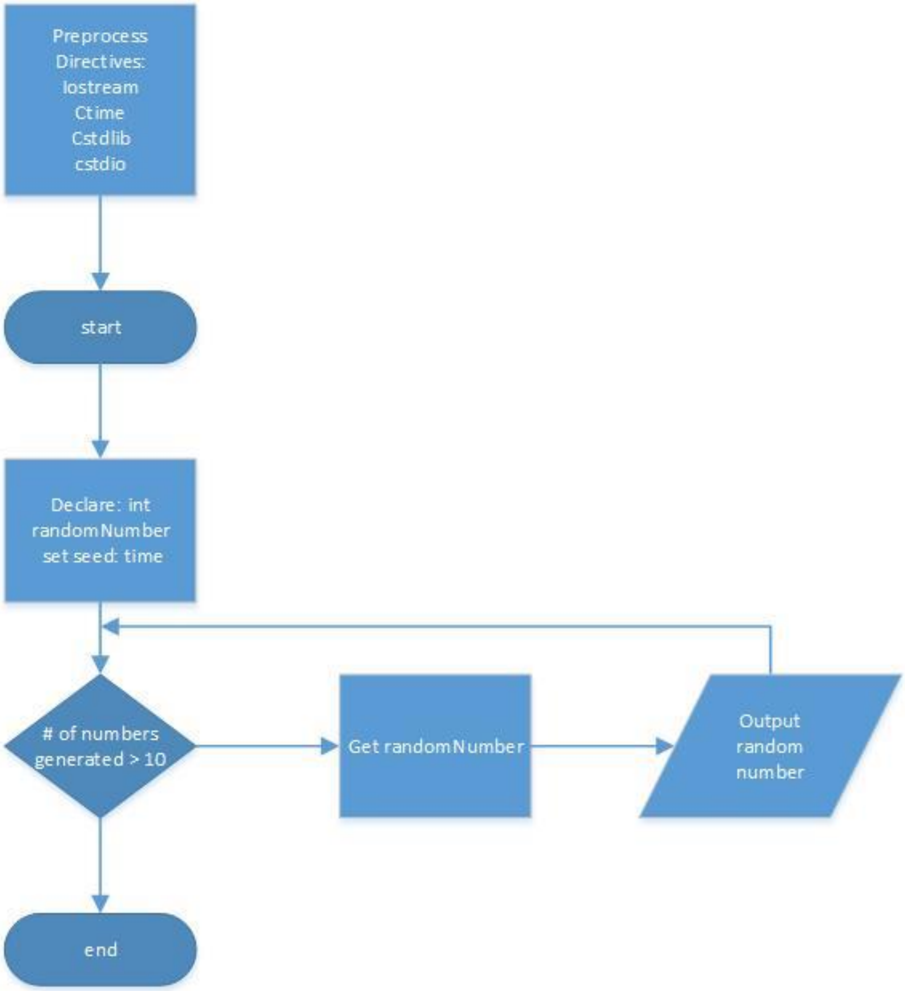
strings.cpp flowchart


Preprocess Directives: Strings Iostream
Start
Declare: string userString Int numLetters = 0
Output: "Please enter word"
Input: Word
Are there more letters in the word
Output letter
Output: Your word spelled backwards is:
Are there more letters?
Output letter
Add 1 to numLetter
Output: your word has numLetters letters
Set numLetters back to zero Cin.ignore
Output" Now let's try a phrase
Input: phrase
Are there more characters?
Output character
Output: Your phrase backwards is spelled:
Are there more characters?
Output characters
Add 1 to numLetters
Output "your phrase has numLetters letters
end

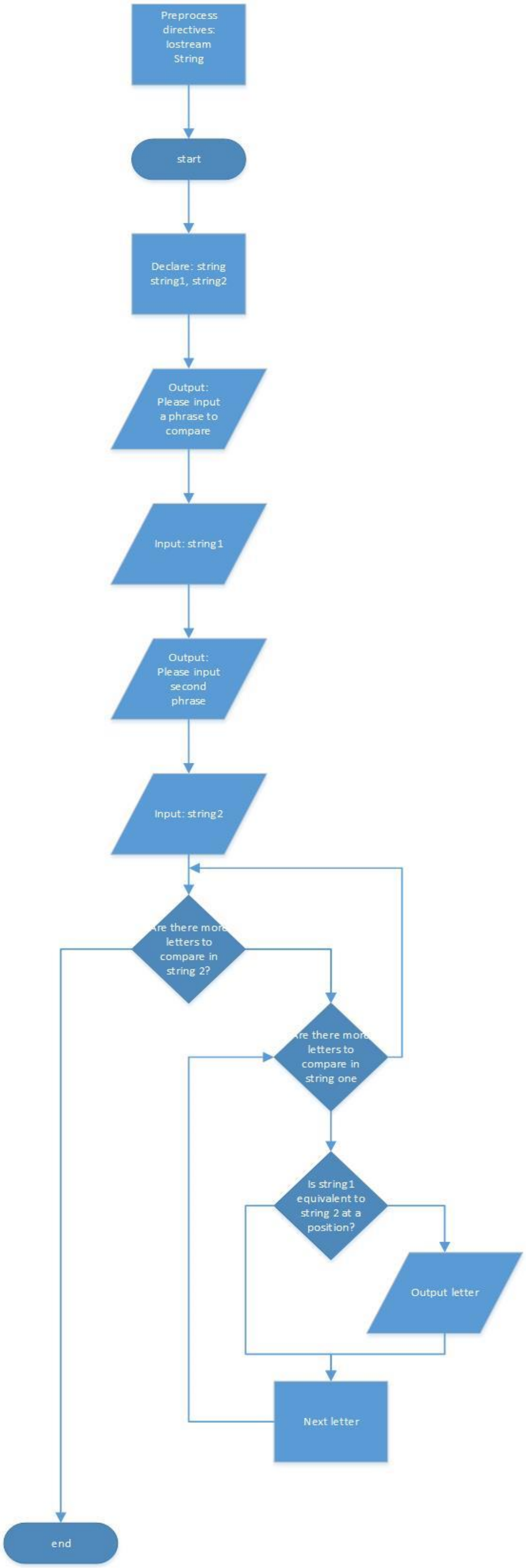
name.cpp flowchart


Preprocess Directives: Iostream string
Start
Declare string fullName, first_name, last_name, middle_name Char spaceOne, spaceTwo, mInitial Int numSpaces
Output: please enter full name in the format first middle last
Input name
Are there spaces in the name?
Count spaces and add to numSpaces
Is there one space?
Are there two spaces?
Separate: first_name, last_name
Output: Please enter your name in the correct order
Take out first, middle, last name
Output: last_name, first_name
Make mInitial = middleName[0]
Output: Last_name, First_name, mInitial
End

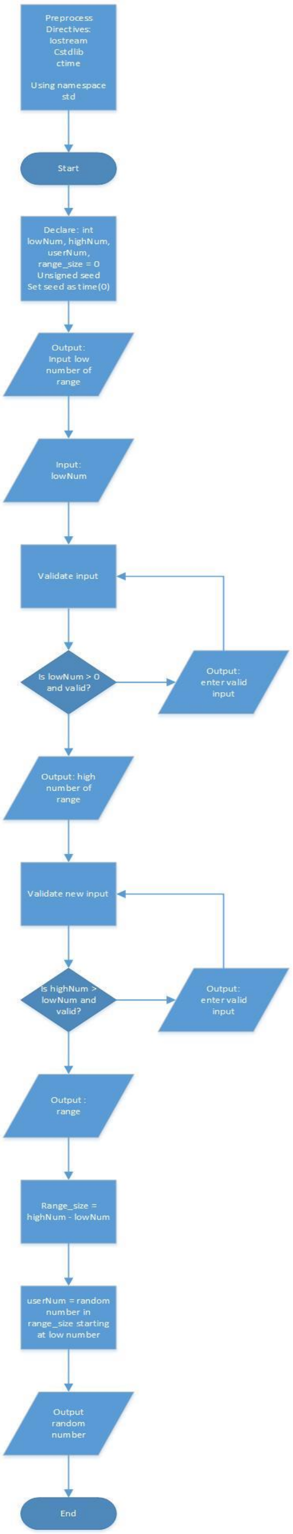
randNum.cpp flowchart


Preprocess Directives: Iostream Ctime Cstdlib cstdio
start
Declare: int randomNumber set seed: time
# of numbers generated > 10
Get randomNumber
Output random number
end

loop.cpp flowchart


Preprocess directives: Iostream String
start
Declare: string string1, string2
Output: Please input a phrase to compare
Input: string1
Output: Please input second phrase
Input: string2
Are there more letters to compare in string 2?
Are there more letters to compare in string one
Is string1 equivalent to string 2 at a position?
Output letter
Next letter
end

randNum2.cpp flowchart


Preprocess Directives: Iostream Cstdlib ctime
Using namespace std
Start
Declare: int lowNum, highNum, userNum, range_size = 0 Unsigned seed Set seed as time(0)
Output: Input low number of range
Input: lowNum
Validate input
Is lowNum > 0 and valid?
Output: enter valid input
Output: high number of range
Validate new input
Is highNum > lowNum and valid?
Output: enter valid input
Output : range
Range_size = highNum - lowNum
userNum = random number in range_size starting at low number
Output random number
End

Word Guessing Game flowchart and design: See file: wordGuessDesign.pdf

Testing

strings.cpp

Word Entered	Expected Result	Actual Result	Phrase Entered	Expected Result	Actual	Num of Letters
chin	Word is spelled c,h,i,n Backwards n,i,h,c	Expected	fish sticks	f,i,s,h, ,s,t,i,c,k,s Backwards s,k,c,i,t,s, ,h,s,i,f	Expected	10
020	020 B: 020	Expected	0 0 0	0 0 0 B: 0 0 0	Expected	0
df5	d5f B:f5d	Expected	00d 66g	00d 66g B: g66 d00	Expected	2
#!	#! B:!#	Expected	# yeah	# yeah B: heay #	Expected	4

name.cpp

Name Entered	Expected Result	Actual Result
W L George	George, W L.	Expected
Will George	George, Will	Expected
Will	Please try again	Expected
0032 531	531, 0032	Expected
John Jacob Jingle-Heimer	Jingle-Heimer, John J	Expected
The big white whale	Please try again	Expected

randNum.cpp

Input	Output Expected	Actual Output
None	10 random numbers between 1 and 1000	Expected

loop.cpp

Phrase 1	Phrase 2	Expected result	Actual result
Food	Food	Food	Fooood* see notes
Fresh	Fish	Fsh	fsh
1357	1658	15	15
We go	Gone we	Goe we	Goe we
Good	opus	Oo	oo

randNum2.cpp

Num 1 Input	Num 2 Input	Expected Output	Actual Output
5	10	A number b/w 5 and 10	7
32000	35000	A number b/w 32000 and 35000	34265
-8		That number is too low	Expected

10	5	Your max should be higher than your min	Expected
32f5		Quit program	Expected
	32f5	Quit program	Expected
	H	That is not an integer, try again	Expected
H		That is not an integer, try again	Expected

Reflection

The purpose of this week was to introduce us to some of the functions and of using strings, for loops, random numbers and input validation. This was probably the toughest week so far but I learned a ton by getting started early and working with others in the class. As I result I'm far more confident in my abilities and understanding as we expand with our use of this language.

The strings program was helpful in understanding position and the length function of a string input. It was also valuable in understanding the cin and getline inputs as well as the isalpha input.

The name program was probably the most challenging of all the programs we made this week. As I started I thought it wouldn't be too bad but I couldn't figure out how to separate the words or account for someone entering 2 names instead of three. Eventually while working with my peers I was able to figure out that we needed use the find function to search the string for the desired character. Which, in this case was the space in between the words. Also there are many means of which someone can parse the words and so it took some exploring to figure out how to do it for this program. The best part about the more challenging programs is the satisfaction you get when the program works.

The first randNum program was very simple and took less than 10 minutes to plan and code. I believe the purpose was just to understand how the random number system works. I believe it will be a valuable tool to have moving forward. Also it was good for practicing the 'for' loops.

The loop program was challenging in the logic of the loops and what the program needed to achieve. To compare the strings you would need some nested for loops to look at each individual letter. This will be valuable for the word guessing program we will be designing for the project this week. One problem I did have with this program was with repeating letters next to each other when both words had them. I haven't yet figured out how to prevent this but it's something I will explore this coming week.

The second randNum program was focused on input validation more than anything. The thing I struggled with here was that I was unsure of what to look for. While I knew I didn't want the user entering a letter instead of a number I didn't think of what would happen if a user entered both an integer and a number until another user mentioned they were having problems with it. It took me a while to figure out what to do in that case, but I settled on it being a fatal error and just exiting completely out of the program.

Finally the word guessing game design was a fun project and I'm excited to start working on the code. It seems like one of the first programs where everyone's result will come out a bit differently to come in line with the desired deliverables. I’m excited to have the opportunity to play around with it and see what we can do.