

# Assignment 1

Write a c++ program that will read in a sequence of character( only lower-case) and their counts from a file, and create two parallel vectors. Then your program will find the long ascending subsequence is the count vector. Then the program should output the corresponding characters for the longest subsequence. You need to write all these functions listed below. **YOU ARE NOT ALLOWED TO USE FUNCTIONS FROM THE ALGORITHM LIBRARY IN THIS ASSIGNMENT**

You need to write the following function.

1. main()
  - a. keep this function short
2. void check(std::vector<char> & c, std::vector<unsigned> & n, char ch, int num)
  - a. this function just check to see if ch is in the vector c
    - i. if ch is in the vector increase the count by num
    - ii. if it isn't add it to the end of the vectors (you should use push\_back)
3. void print\_input(std::vector<char> & c, std::vector<unsigned> & n)
  - a. this function should print out the data in the vectors
    - i. it should be formatted as ("ch : count") with one character and count per line
4. void get\_vector(std::string & name, std::vector<char> & c, std::vector<unsigned> & n){
  - a. This function should be a loop that reads the input from the user and fill the vectors.
  - b. Read the data in line by line and use the check function to add to the vectors
5. void longest\_asc\_sub(const std::vector<unsigned> & n, int & start, int & len)
  - a. This function should find the longest ascending subsequence is the n vector
  - b. The function should store the beginning of the sequence in start and the length of the sequence in len
6. void print\_subset(const std::vector<char> & c, int start, int len)
  - a. This function should print out the elements in the vector starting a start and end at start+len

Example 1

Input file

a 1

b 2

z 1

j 10

q 7

## Output

a : 1

b : 2

z : 1

j : 10

q : 7

a b

## Example 2

### Input file

n 32

j 36

k 7

w 43

z 24

q 2

l 7

n 19

q 2

r 11

### Output

n : 51

j : 36

k : 7

w : 43

z : 24

q : 4

l : 7

r : 11

q l r

## Submissions

- Submit to D2L a zip/archive file containing the .cpp files you have written and all other files needed to run the program this include the test files
- 3 marks for comments and code format
- If you do not zip your file, you will receive **ZERO** (<http://www.wikihow.com/Zip-Files-Together>)