

Outbreak!

Infection spreads across the land. Cities are now being monitored by the CDC. The CDC is keeping a list of infected cities and applying an infection level to each city. Once the infection level rises high enough, a new city is created with the healthy that remain and the original city is placed in quarantine.

Requirements

- You'll read in from a file a list of cities (with name, population, and current infection level). The file name will be passed from the command line.
 - As you are adding cities to your list, you must keep them sorted by population (descending order – greatest to least)
- You will then prompt the user for what happens next (see below):
 - User options:
 - Increase the infection level of **all** cities by 1
 - Increase the infection level of a specific city by 1
 - Print the status of a city (searched by name)
 - Print all cities above a certain infection level
 - Create quarantine log
 - Save all quarantined cities information to a file named by the user
 - Format must match that of the input file
 - Repeat all options until the user wants to exit
- Monitor the user's actions and take any needed actions based on a city's infection level

Infection level	Required Action(s)
0	None
1	<ul style="list-style-type: none">• Remove this city from the list• Decrease the population by 10% (round to a whole number)• Add it back to the list (this helps keeps the list sorted by population)
2	<ul style="list-style-type: none">• Remove this city from the list• Decrease the population by 20% (round to a whole number)• Add it back to the list (this helps keeps the list sorted by population)
3	Take 25% (round to a whole number) of the population and form a new city (both cities should be removed and added back to the list as before). The new city has an infection level of 0. The old city keeps the level of 3.
4	<p>All hope is lost for the city:</p> <ul style="list-style-type: none">• The city is removed from the infected list and moved to the quarantined list (with its remaining inhabitants).• A message "City X has been placed in quarantine" is printed to the screen• This city can no longer be interacted with other than to be saved in the quarantine log

Notes:

- When forming a new city, the name will always be the name of the old city with a "New" in front (e.g. New Eau Claire, New Kansas City, etc.)
 - It's okay to have a "New New New Altoona"
- Once a city is moved to quarantine, it does not change infection level or population
- **Both** lists should be ordered by population (descending). Rank by infection level then alphabetically by name in a tie.
- At least one city needs be quarantined before the user can make the quarantine log

Sample input file

The input will with be organized in the following way: <city>, <population>, <current infection level>

Abbotsford,2310,2

Adams,1967,1

Algoma,3167,2

Alma,781,0

Altoona,6706,0

Amery,2902,2

Antigo,8234,3

Notes:

- No actions need to be taken upon reading the file. Only take action based on user interaction
- City names may contain spaces
- Populations will always be a whole number
- Files will always be properly formatted

Sample menu

This is a sample interaction with the provided sample input file. **Bolded** is user input.

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city
- 4) Create quarantine log
- 5) Print all cities above an infection level
- 6) Exit

Choice: **1**

The infection level for all cities has been increased.

Antigo has been placed in quarantine!

New Algoma has been made.

New Amery has been made.

New Abbotsford has been made.

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city
- 4) Create quarantine log
- 5) Print all cities above an infection level
- 6) Exit

Choice: **2**

Which city do you want to infect?: **Altoona**

Infection level for Altoona increased by 1

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city
- 4) Create quarantine log
- 5) Print all cities above an infection level
- 6) Exit

Choice: **2**

Which city do you want to infect?: **New Algoma**

Infection level for New Algoma increased by 1

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city
- 4) Create quarantine log
- 5) Print all cities above an infection level
- 6) Exit

Choice: **3**

Which city do you want the status of?: **Fake City**

Sorry, Fake City is not a city in the list.

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city
- 4) Create quarantine log
- 5) Print all cities above an infection level
- 6) Exit

Choice: **3**

Which city do you want the status of?: **Altoona**

Status: Altoona, 4829, 2

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city
- 4) Create quarantine log
- 5) Print all cities above an infection level
- 6) Exit

Choice: **4**

What do you want to name the log?: **Q1.txt**

Make a selection:

- 1) Increase infection level of all cities
- 2) Increase infection level of specific city
- 3) Print status of a specific city

4) Create quarantine log
5) Print all cities above an infection level
6) Exit
Choice: 5

Cities above what level?: 2
Cities above level 2:
Algoma, 2376, 3
Amery, 2177, 3
Abbotsford, 1733, 3

Make a selection:
1) Increase infection level of all cities
2) Increase infection level of specific city
3) Print status of a specific city
4) Create quarantine log
5) Print all cities above an infection level
6) Exit
Choice: 6

Good bye.

The Q1.txt file should contain:

Antigo, 8234, 4

Classes to make

- Node
- List / SSList (You may use a C++ library, if it does everything you need)
- OrderedList
 - Has a private SSList
- MedicalExecutive class
 - Reads in the initial list of cities
 - Maintains the infected cities list and the quarantined cities list
 - Handles User Interaction
- City class
 - Holds the information for one city
 - Implement getters, setters, and constructors that make sense

You must create a makefile to compile your code. I will be verifying that it will correctly compile and link your application.

You should create test files that have cities with the same populations and same infection levels to make sure that you are inserting your cities correctly (i.e. alphabetically ordered)!!!