Autumn Boone

CSE 130 Section A

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130 Final Project: Illness Checker

Explanation of Code

My code is broken down into the following sections in this order…

1) Libraries
2) Base class
   a. Boolean variables that represent symptoms
3) Derived class
   a. Constructor that randomizes symptoms
   b. Method that checks for illness
4) Main function
   a. Main menu
   b. Prompt to user that asks for number of patients
   c. Count variables that represent how many people have each illness
   d. Srand(time(0)) seed
   e. Class constructor call
   f. For loop that calls checkIllness() function and adds to counts
   g. Printing counts
   h. Printing percentages and "+" signs

My code can be explained in this process (which is further explained below)…

1) Libraries
2) Main menu and patientCount
3) randomize
   o initialize variables in person class
   o call random seed
   o call constructor
   o make 7 different random variables
   o 7 different if statements
   o Result of random symptoms
4) checkIllness()
   o method in the derived class
   o if else if else statement
   o explain returns
   o initialize count variables outside of loop
   o for loop
   o increment counts based on return
5) print raw number, percentages, and + signs

First, I began the program with the following libraries: iostream(which includes input and output functions), cstdlin (which includes the rand() function), and ctime(which includes the time() function). I also introduced the standard namespace so that I could shorten the cout and cin functions.

Second, in my main function I print the main menu with the common symptoms of COVID-19, a cold, and the flu. Then, I ask the user how many patients he/she wants to analyze, defined by the variable "patientCount."

Third, in order to analyze the symptoms of these patients, you first have to randomize the symptoms and check if the patient has an illness. The code for these processes are both in the derived class called "Patient." However, I first made a base class "Person" that contains a Boolean variable for each symptom. I assigned a default value "false" to each of these variables, assuming that a normal, healthy person does not have any of these symptoms. In this context, false means the symptom is absent and true means the symptom is present. In the main function, I called the random seed (srand(time(0)) before I randomize the symptoms. To call this section of code, I called the constructor of the derived class with an array with size of "patientCount." In this constructor, there are 7 new variables that use the rand() function to randomly assign to either false or true. There are also 7 if else statements to assign the symptoms variables with a random value. As a result, the 7 random variables declared in the base class are passed into the derived class and assigned random values in the if else statements.

Fourth, these symptoms for each patient have to be checked for an illness. In the main function, 4 count variables are initialized. A for loop is also written, where the loop runs "patientCount" times. Within the for loop the method "checkIllness()" in the derived class is called. In this function, there are if statements that returns 1 if the patient has COVID, returns 2 for a cold, returns 3 for the flu, and returns 4 for another illness. Back in the main function, the variable "illness" hold the return values. Then, there are 4 if statements that increase the count variables.

Fifth, these count variables are printed and presented to the user. Then, these count variables are divided by the "patientCount" and typecasted as a float. These floats are them printed and presented to the user as percentages of people with that illness. Finally, I use the count variables to print plus signs for each person with each illness.

Screenshot of Final Products

Screenshot with percentages as whole numbers (still floats)

```
Select C:\Users\autum\OneDrive\Spring 2022\CSE 130\Labs\Boone_Autumn_IllnessChecker.exe
Welcome to Symptoms Checker

Guide:   * Common   + Sometimes/Rarely   - NO
===========================================
Symptoms           | COVID-19 | Cold | Flu |
Fever              |    *     |  +   |  *  |
Cough              |    *     |  +   |  *  |
Shortness of Breath|    *     |  -   |  -  |
Runny Nose         |    +     |  *   |  +  |
Headaches          |    +     |  +   |  *  |
Sneezing           |    -     |  *   |  -  |
Fatigue            |    *     |  +   |  *  |
===========================================

Enter the number of patients: 100
Thank you...
===========================================

Symptoms Checker...

1 patients have symptoms of COVID-19

14 patients have symptoms of a cold

1 patients have symptoms of the flu

84 patents may have some other illness


===========================================

Percentage of each illness:

COVID-19: [1%]
+

Cold: [14%]
++++++++++++++

Flu: [1%]
+

Other illnesses: [84%]
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

Screenshot with percentages as floats

C:\Users\autum\OneDrive\Spring 2022\CSE 130\Labs\Boone_Autumn_IllnessChecker.exe

```
Welcome to Symptoms Checker

Guide:   * Common    + Sometimes/Rarely   - NO
=============================================
Symptoms              | COVID-19 | Cold | Flu |
Fever                 |    *     |  +   |  *  |
Cough                 |    *     |  +   |  *  |
Shortness of Breath   |    *     |  -   |  -  |
Runny Nose            |    +     |  *   |  +  |
Headaches             |    +     |  +   |  *  |
Sneezing              |    -     |  *   |  -  |
Fatigue               |    *     |  +   |  *  |
=============================================

Enter the number of patients: 97
Thank you...
=============================================

Symptoms Checker...

3 patients have symptoms of COVID-19

6 patients have symptoms of a cold

1 patients have symptoms of the flu

87 patents may have some other illness


=============================================

Percentage of each illness:

COVID-19: [3.09278%]
+++

Cold: [6.18557%]
++++++

Flu: [1.03093%]
+

Other illnesses: [89.6907%]
+++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++


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Process exited with return value 0
Press any key to continue . . .
```