

## ASEN 1320 Fall 2020

### Homework Assignment 4: FAA Air Traffic

Due: 11:59pm on September 27 (Sunday)

The FAA provides air traffic services for the world's largest and busiest airspace. Tens of thousands of aircraft are guided safely and expeditiously every day through America's National Airspace System to their destinations. The National Airspace System is composed of 518 airport towers, 154 terminal radar control facilities, and 25 control centers. Airport operations are the sum of the number of airport arrivals and departures. Airport traffic controllers handle such operations. Each flight has a departure and arrival, meaning each flight has two airport operations. In FY2018, Core 30 airport operation numbers rose by 1.8 percent, from 12,782,513 to 13,018,200. As a volunteer, you're asked to (1) **sort** the Core 30 airport operation data according to the average airport operation data in ascending order (arranged from smallest to largest), and (2) **identify** airports that airport operation rose in FY17-18 above the average. Write a C++ program that performs all the tasks specified below.

- The source file should be named **faa.cpp**, and should have adequate comments for the purpose of documentation.
- All the computation should be done just in main () using iostream, string and fstream libraries, 1D arrays, and loops.
- The program needs to read airport operation data from a text file by connecting an input stream to a file using **ifstream**. Note that **cin** is an example of an input stream connected to keyboard (standard input).
- The text file named "**AirTraffic.txt**" is provided on Canvas, which needs to be placed in the same directory where you run the C++ program on Cloud 9 IDE. The first column is the airport code name, the second, third and forth columns are the average, FY17, and FY18 airport operation data for a given airport.
- The airport code name should be read in as a 1D array of **string** data type.
- The airport operation data (e.g., average, FY17, FY18 ) should be read in as a 1D array of **int** data type.
- Once the airport operation data is **sorted** according to the average airport operation data in ascending order, the program should print on the console the airport code name and average airport operation data as "XYZ 123456" in ascending order where XYZ is an example of airport code name.
- **Identify** airports that airport operation rose in FY17-18 above the average and print out a message "XYZ airport operation rose above average in FY17-18" on separate new lines in ascending order of the average airport operation data.
- Write your original version of **faa.cpp**, compile and run test cases on AWS

cloud 9 IDE, and submit only **faa.cpp** to GradeScope. There is **no need** to upload the "**AirTraffic.txt**" text file to Gradescope.

- Sample console output:

```
Run Command: hw4/faa.cpp

Running /home/ec2-user/environment/hw4/faa.cpp
TPA 191935
SAN 201267
MEM 222438
MDW 250437
BWI 253043
FLL 290421
DCA 295755
IAD 300928
HNL 310379
MCO 322273
SLC 323820
LGA 369741
BOS 391820
SEA 392005
DTW 392192
PHL 396438
MIA 410721
MSP 411795
EWR 427414
PHX 434928
SFO 446974
JFK 447531
IAH 481203
LAS 531533
CLT 547626
DEN 574894
DFW 670745
LAX 675343
ORD 877009
ATL 885310
TPA airport operation rose above average in FY17-18
SAN airport operation rose above average in FY17-18
BWI airport operation rose above average in FY17-18
FLL airport operation rose above average in FY17-18
DCA airport operation rose above average in FY17-18
HNL airport operation rose above average in FY17-18
MCO airport operation rose above average in FY17-18
SLC airport operation rose above average in FY17-18
BOS airport operation rose above average in FY17-18
SEA airport operation rose above average in FY17-18
DTW airport operation rose above average in FY17-18
EWR airport operation rose above average in FY17-18
SFO airport operation rose above average in FY17-18
JFK airport operation rose above average in FY17-18
LAS airport operation rose above average in FY17-18
CLT airport operation rose above average in FY17-18
DEN airport operation rose above average in FY17-18
LAX airport operation rose above average in FY17-18

Process exited with code: 0
```