Homework 2

100 Points

2D Arrays

Project: Airports (see next pages)

Grading

1. main() – 10
2. Get data from file – 20
3. Write table – 20
4. Lists of destinations – 20
5. Groups of two – 20
6. Report – 10

Write a short report (not more than one page) to explain the design of your program:

→ Show how data are organized in 1D arrays and/or tables
// What are the arrays used in this program?

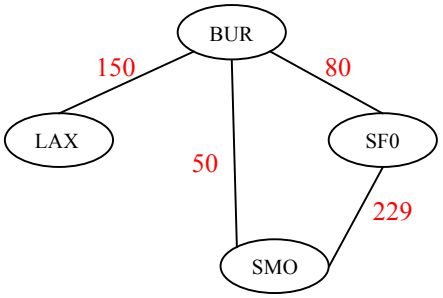
→ Show the structure of your program
// structure chart or pseudocode
// What are the functions used in this program

Run the program once and save the output at the end of the source file as a comment. Compress the source file, input and output files (if any), and the report, and upload the compressed file: 22B_LastName_FirstName_H2.zip

Project: Airports

Maximum number of airports in a state: **30**. All airports are identified by a **3** letter code, such as SFO. Create the input file using data on the next page. The data file, **airports.txt**, begins with **n**, the number of airports, followed by their codes, in alphabetical order. On the next n lines, for each airport in the list, there is a list of numbers showing the price of a ticket from that airport to all of the others.

```
4
BUR
LAX
SFO
SMO
  0 150  80  50
150   0   0   0
 80   0   0 229
 50   0 229   0
```



For instance the first line means that from BUR you can fly to three places: LAX, with $50, to SFO - $80, and to SMO - $125.

Read the list of airport codes into a table. Read the remaining lines into another table.

Output should consist of the following:

1. The original table formatted as shown below:

```
     | BUR LAX SFO SMO
---  --- --- --- ---
BUR |   0 150  80  50
LAX | 150   0   0   0
SFO |  80   0   0 229
SMO |  50   0 229   0
```

2. For each airport list its destinations; include the number of destination airports too.

```
BUR (3): LAX, SFO, SMO
LAX (1): BUR
SFO (2): BUR, SMO
SMO (2): BUR, SFO
```

3. List all groups of two airports connected by flights:

```
BUR - LAX
BUR - SMO
BUR - SFO
SFO - SMO
```

4. For each airport list its cheapest destination:

```
BUR -> SMO   50
LAX -> BUR  150
SFO -> BUR   80
SMO -> BUR   50
```

```
12
BUR
FAT
LGB
LAX
MRY
OAK
SMF
SAN
SFO
SJC
SBO
SMO
  0   0   0   0 122   0   0   0   0   0 316   0
  0   0   0   0   0   0   0   0 321 455   0   0
  0   0   0 125   0   0   0   0 267   0   0   0
  0   0 125   0   0  50   0   0 250   0 370   0
122   0   0   0   0 259   0   0   0   0   0 119
  0   0   0  50 259   0   0 129   0   0   0   0
  0   0   0   0   0   0   0 111   0   0 125   0
  0   0   0   0   0 129 111   0   0   0   0   0
  0 321 267 250   0   0   0   0   0 190   0   0
  0 455   0   0   0   0   0   0 190   0   0   0
316   0   0 370   0   0 125   0   0   0   0 145
  0   0   0   0 119   0   0   0   0   0 145   0
```