Exercise 5 (10 points) – can be done individually or in pair
- The first lines of all source files must be comment containing <u>names & IDs of all members</u>. Also create file <u>readme.txt</u> containing names & IDs of all members.

- Put all files (source, input, output) in folder Ex5_xxx where xxx = your full ID. That is, your source files must be in package Ex5_xxx and input/output files (if there is any) must be read from/write to this folder. <u>From now on, you'll get point deduction for wrong package & folder structure</u>.

- The group representative zips Ex5_xxx & submits it to Google Classroom. The other members submit only readme.txt. Email submission is not accepted.

- The exercise is graded only once, and after graded, members can't be added.

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Modify your code from Exercise 4 to handle exceptions. All reused code from Exercise 4 <u>must be submitted with Exercise 5</u> (I won't go back to get it from your previous submission).

1. Handle exceptions when opening file i.e. when file is not found. Keep asking user for a valid file name.

2. Handle exceptions when user inputs non-numeric integer for min aircraft threshold. Keep asking user for a valid input.

3. Put the code that reads & splits each line of data in try-catch. If a runtime exception occurs, print exception message and line that causes the exception. Then, skip that line and read the next one. <u>Take note of which exception occurs in which situation, as this will be asked in Midterm exam</u>.

4. Use code from Exercise 4 to select, sort, and print Airline objects as before. Due to the exceptions in (3), some of them will be excluded from the output.

names,	ICAO,	aircraft,	destinations	
China Southern Airlines,	CSN,	629,	2l6	l instead of one
Egyptair,	MSR,	78,	1O2	O instead of zero
VietJet Air	VJC,	77,	115	missing comma
Air Asia,	AXM,	255,	-165	invalid value (negative)
Japan Airlines,	JAL,	152;	88	semi-colon instead of comma
Ryanair,	Ryan,	611,	235	wrong ICAO code
Malaysia Airlines,	MAS,	7.7,	75	double instead of int
Qantas,	QFA,	125		missing column
United Airlines,	UAL,	1K,	365	non-numeric value
Asiana Airlines,	AAR,	83,	90, 10	exceeding column
Etihad Airways,		103,	81	missing column
Bangkok Airways;	BKP,	3S,	-30	multiple exceptions

Note 1 : Some conditions such as invalid number will not cause runtime exception. You have to check these conditions & throw exceptions by yourself.

```
if (value < 0)  throw new MyException("Invalid " + value);    // your own class
if (value < 0)  throw new IllegalArgumentException(value);    // Java class
```

Note 2 : Some conditions such as exceeding column or wrong ICAO code don't cause runtime exception or have any effect on the calculation or result. You can just ignore them, e.g. let the program read only columns 0-3 or use the wrong code to still identify the airline.

Note 3 : Some conditions such as input being double instead of int may or may not cause runtime exception, depending on how you handle input String e.g.
  - Convert String to int directly
  - Convert String to double, then cast double to int

```
--- exec:3.1.0:exec (default-cli) @ solutions ---
java.io.FileNotFoundException: src\main\java\Ex5\airlines_error.txt (The system cann
New file name =
airline_errs.txt
java.io.FileNotFoundException: src\main\java\Ex5\airline_errs.txt (The system cannot
New file name =
airlines_errors
java.io.FileNotFoundException: src\main\java\Ex5\airlines_errors (The system cannot
New file name =
airlines_errors.txt


java.lang.NumberFormatException: For input string: "2l6"
China Southern Airlines,        CSN,        629,      2l6


java.lang.NumberFormatException: For input string: "1O2"
Egyptair,                       MSR,        78,       1O2


java.lang.ArrayIndexOutOfBoundsException: Index 3 out of bounds for length 3
VietJet Air                     VJC,        77,       115


Ex5.InvalidNumberException: For destinations: "-165"
Air Asia,                       AXM,        255,      -165


java.lang.NumberFormatException: For input string: "152;      88"
Japan Airlines,                 JAL,        152;      88


java.lang.NumberFormatException: For input string: "7.7"
Malaysia Airlines,              MAS,        7.7,      75


java.lang.ArrayIndexOutOfBoundsException: Index 3 out of bounds for length 3
Qantas,                         QFA,        125


java.lang.NumberFormatException: For input string: "1K"
United Airlines,                UAL,        1K,       365


java.lang.ArrayIndexOutOfBoundsException: Index 3 out of bounds for length 3
Etihad Airways,                             103,      81


Ex5.InvalidNumberException: For aircraft: "-30"
Bangkok Airways;                BKP,        3S,       -30


Airline                              Aircraft      Destinations
=========================================================
American Airlines          (AAL)        985            353
Delta Air Lines            (DAL)        982            311
Ryanair                    (RYAN)       611            235
China Eastern Airlines     (CES)        588            248
Air China                  (CCA)        456            201
EasyJet                    (EZY)        347            157
Lufthansa                  (DLH)        274            229
All Nippon Airways         (ANA)        255            97
Qatar Airways              (QTR)        252            198
Emirates Airlines          (UAE)        252            157
British Airways            (BAW)        244            206
Air France                 (AFR)        226            184
Singapore Airlines         (SIA)        159            137
Korean Air                 (KAL)        159            121
Cathay Pacific             (CPA)        152            88
Ethiopian Airlines         (ETH)        146            155
Garuda Indonesia           (GIA)        134            90
Flydubai                   (FDB)        87             127
EVA Airways                (EVA)        87             62
Asiana Airlines            (AAR)        83             90
Finnair                    (FIN)        80             104
Thai Airways International  (THA)        79             65
Philippine Airlines        (PAL)        77             75
Cebu Pacific               (CEB)        52             62
```

Handle missing file (incorrect file name).

Check validity condition by yourself & throw exception from your own class or Java's existing class.

If converting String to int.

Depending on the order of exception handling. Termination model handles only 1st exception.

If ignoring wrong ICAO code, this line can be treated as valid line

If ignoring exceeding columns, this line can be treated as valid line

```
Enter s/S to search airlines; f/F to filter airlines; else to quit
s
Enter airline code =
ryan        Can still use wrong code to identify airline
Airline                              Aircraft      Destinations
==================================================================
Ryanair                  (RYAN)         611            235

Enter s/S to search airlines; f/F to filter airlines; else to quit
f
Enter min aircraft threshold (int) =
xxx
Enter min aircraft threshold (int) =          Handle invalid keyboard input
500.5
Enter min aircraft threshold (int) =
500
Airline                              Aircraft      Destinations
==================================================================
American Airlines        (AAL)          985            353
Delta Air Lines          (DAL)          982            311
Ryanair                  (RYAN)         611            235
China Eastern Airlines   (CES)          588            248
```

```
Airline                              Aircraft      Destinations
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Philippine Airlines      (PAL)          77             75
Cebu Pacific             (CEB)          52             62
Malaysia Airlines        (MAS)          7              75
```

If converting String to double & casting double to int, this line can be treated as valid line.