Exercise 4 (10 points)

- The first lines of all source files must be comment containing your name & ID

- Put all files (source, input, output) in folder Ex4_xxx where xxx = your full ID. That is, your source files must be in package Ex4_xxx and input/output files (if there is any) must be read from/write to this folder

- Zip Ex4_xxx & submits it to Google Classroom. Email submission is not accepted

===

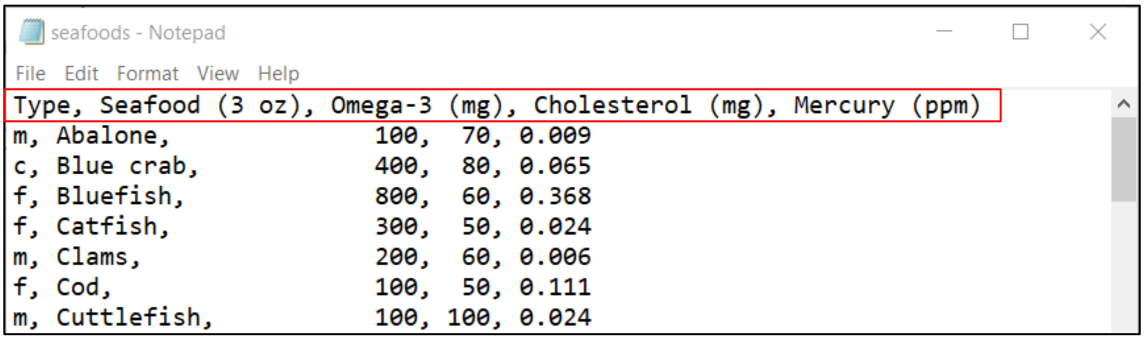
Keep your source code for Exercise 5

1. Copy class Seafood to your source file. Complete this class to make it concrete, but do not change the visibility of each member.

```
class Seafood implements Comparable<Seafood> {
   private String   name, type;
   private int      omega3, cholesterol;
   private double   mercury;

   public int compareTo(Seafood other) {
      // add your code according to conditions in 2.2-2.5
   }
}
```

2. Write another class that acts as the main class



```
Type, Seafood (3 oz), Omega-3 (mg), Cholesterol (mg), Mercury (ppm)
m, Abalone,                100,  70, 0.009
c, Blue crab,              400,  80, 0.065
f, Bluefish,               800,  60, 0.368
f, Catfish,                300,  50, 0.024
m, Clams,                  200,  60, 0.006
f, Cod,                    100,  50, 0.111
m, Cuttlefish,             100, 100, 0.024
```

2.1 Create an ArrayList of Seafoods. Read each line of input file into a Seafood object, and add this object to the ArrayList.

- Col 0 = type (f = fish, c = crustacean, m = mollusk)
- Col 1 = name
- Col 2 = omega-3 in mg
- Col 3 = cholesterol in mg
- Col 4 = mercury in ppm

The first line contains column names. Don’t remove this line from input file, but make your program skip it.

2.2 Sort Seafoods in decreasing order of omega3 (i.e. Seafoods with more omega3 come first)

2.3 If omega3 are equal, sort the objects in increasing order of cholesterol (i.e. Seafoods with less cholesterol come first)

2.4 If omega3 and cholesterol are equal, sort the objects in increasing order of mercury (i.e. Seafoods with less mercury come first)

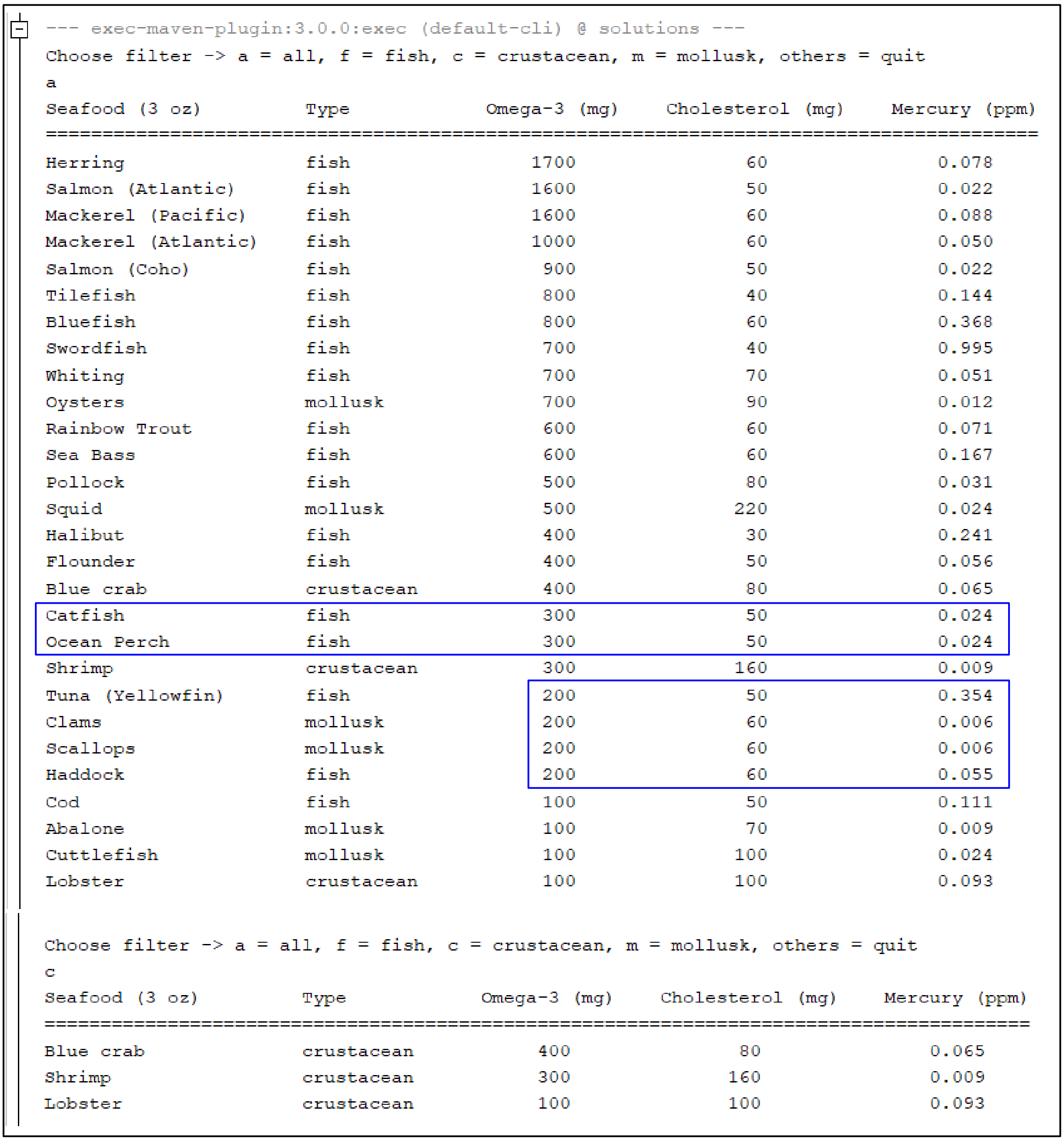
2.5 If omega3, cholesterol, and mercury are equal, sort the objects in alphabetical order of name

```
3. Get filter from user
   3.1 If filter = "a" or "A"    --> print all Seafoods in the sorted order
   3.2 If filter = "f" or "F"    --> print only fish in the sorted order
   3.3 If filter = "c" or "C"    --> print only crustaceans in the sorted order
   3.4 If filter = "m" or "M"    --> print only mollusks in the sorted order

   3.5 The program must be able to loop for a new input filter
```

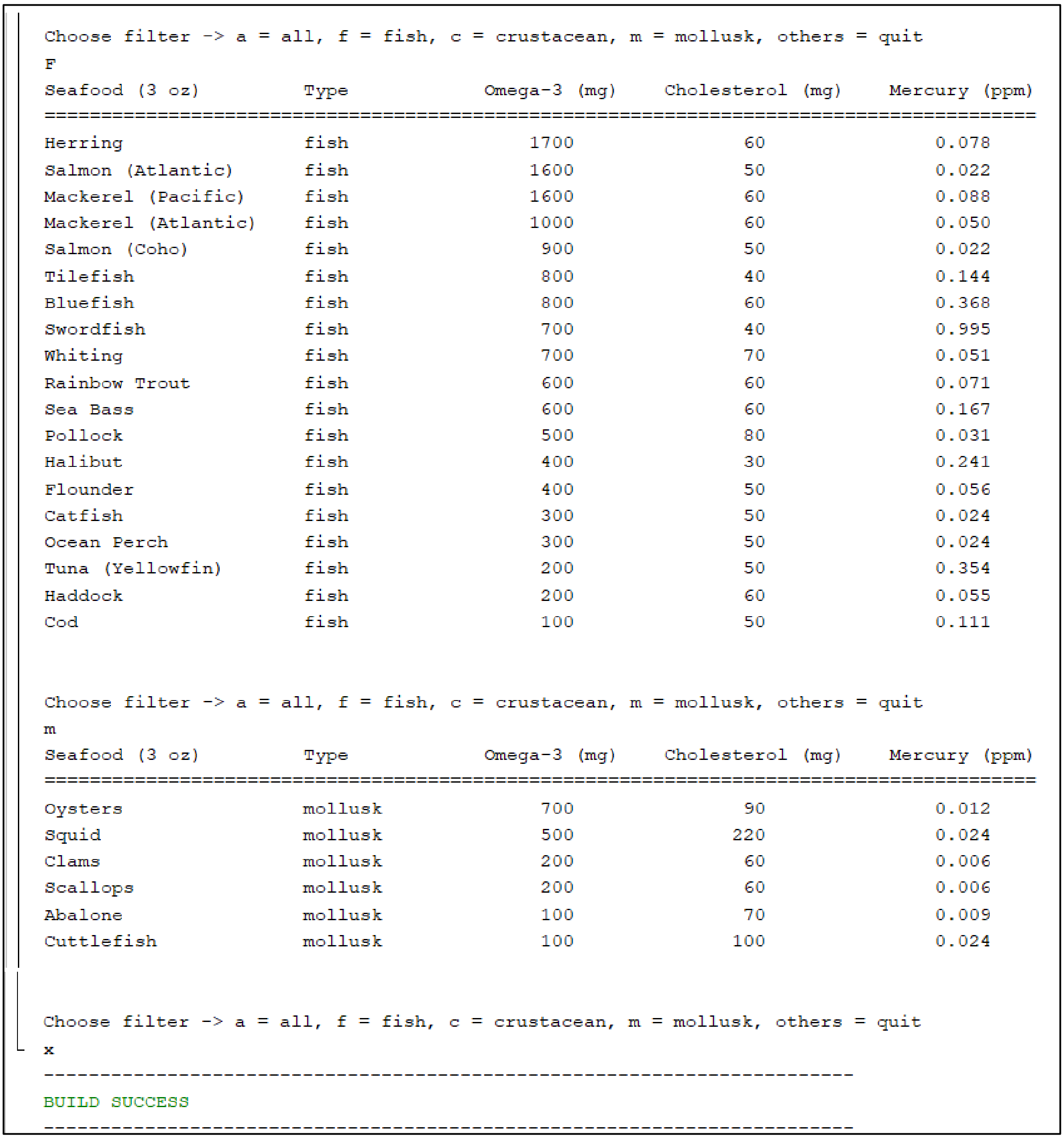
Note – Class String in Java already implements compareTo and compareToIgnoreCase

```
   String s1 = "Haddock";
   String s2 = "Halibut";
   int x = s1.compareToIgnoreCase(s2);      // x = -8, i.e. Haddock comes first (d – l = -8)
   int x = s2.compareToIgnoreCase(s1);      // x = 8,  i.e. Halibut comes later (l – d = 8)
```



```
--- exec-maven-plugin:3.0.0:exec (default-cli) @ solutions ---
Choose filter -> a = all, f = fish, c = crustacean, m = mollusk, others = quit
a
Seafood (3 oz)         Type            Omega-3 (mg)    Cholesterol (mg)    Mercury (ppm)
=========================================================================================
Herring                fish                1700              60               0.078
Salmon (Atlantic)      fish                1600              50               0.022
Mackerel (Pacific)     fish                1600              60               0.088
Mackerel (Atlantic)    fish                1000              60               0.050
Salmon (Coho)          fish                 900              50               0.022
Tilefish               fish                 800              40               0.144
Bluefish               fish                 800              60               0.368
Swordfish              fish                 700              40               0.995
Whiting                fish                 700              70               0.051
Oysters                mollusk              700              90               0.012
Rainbow Trout          fish                 600              60               0.071
Sea Bass               fish                 600              60               0.167
Pollock                fish                 500              80               0.031
Squid                  mollusk              500             220               0.024
Halibut                fish                 400              30               0.241
Flounder               fish                 400              50               0.056
Blue crab              crustacean           400              80               0.065
Catfish                fish                 300              50               0.024
Ocean Perch            fish                 300              50               0.024
Shrimp                 crustacean           300             160               0.009
Tuna (Yellowfin)       fish                 200              50               0.354
Clams                  mollusk              200              60               0.006
Scallops               mollusk              200              60               0.006
Haddock                fish                 200              60               0.055
Cod                    fish                 100              50               0.111
Abalone                mollusk              100              70               0.009
Cuttlefish             mollusk              100             100               0.024
Lobster                crustacean           100             100               0.093


Choose filter -> a = all, f = fish, c = crustacean, m = mollusk, others = quit
c
Seafood (3 oz)         Type            Omega-3 (mg)    Cholesterol (mg)    Mercury (ppm)
=========================================================================================
Blue crab              crustacean           400              80               0.065
Shrimp                 crustacean           300             160               0.009
Lobster                crustacean           100             100               0.093
```



```
Choose filter -> a = all, f = fish, c = crustacean, m = mollusk, others = quit
F
Seafood (3 oz)         Type            Omega-3 (mg)    Cholesterol (mg)    Mercury (ppm)
=========================================================================================
Herring                fish                1700              60                0.078
Salmon (Atlantic)      fish                1600              50                0.022
Mackerel (Pacific)     fish                1600              60                0.088
Mackerel (Atlantic)    fish                1000              60                0.050
Salmon (Coho)          fish                 900              50                0.022
Tilefish               fish                 800              40                0.144
Bluefish               fish                 800              60                0.368
Swordfish              fish                 700              40                0.995
Whiting                fish                 700              70                0.051
Rainbow Trout          fish                 600              60                0.071
Sea Bass               fish                 600              60                0.167
Pollock                fish                 500              80                0.031
Halibut                fish                 400              30                0.241
Flounder               fish                 400              50                0.056
Catfish                fish                 300              50                0.024
Ocean Perch            fish                 300              50                0.024
Tuna (Yellowfin)       fish                 200              50                0.354
Haddock                fish                 200              60                0.055
Cod                    fish                 100              50                0.111


Choose filter -> a = all, f = fish, c = crustacean, m = mollusk, others = quit
m
Seafood (3 oz)         Type            Omega-3 (mg)    Cholesterol (mg)    Mercury (ppm)
=========================================================================================
Oysters                mollusk              700              90                0.012
Squid                  mollusk              500             220                0.024
Clams                  mollusk              200              60                0.006
Scallops               mollusk              200              60                0.006
Abalone                mollusk              100              70                0.009
Cuttlefish             mollusk              100             100                0.024


Choose filter -> a = all, f = fish, c = crustacean, m = mollusk, others = quit
x
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
```