EGCI 213

Group Project 1 – Online Shopping Simulation

The project can be done in a group of <= 4 students. Each group must do the project by themselves. **Everyone involved in cheating will get ZERO point**

1. Implement **class Product** that represents an individual product read from underline products.txt. Each line of the input file consists of

- Column 1 = product name
- Column 2 = price (baht)
- Column 3 = weight (gram)

```
Bluetooth Speaker, 500, 550
External HDD,      2350, 210
Power Bank,         850, 340
USB Hub,           1100,  40
Wireless Mouse,     460,  90
```

Your class should have variables to keep underline total sales in cash and underline total sales in units.

Don't hard code product information. I may change product names, prices, weights, or the order among them to check whether your calculation is correct. But there are always 5 products in this file.

2. Implement **class Customer** that represents an individual customer. Customer name is read from underline orders.txt in (3). Your class should have variable to keep underline cashback calculated from purchase order

3. Implement **class Order** that represents an individual order read from underline orders.txt. Each line of the input file consists of

- Column 1 = order ID
- Column 2 = customer name
- Column 3 = shipping type (E = express, S = standard)
- Last 5 columns = units of products 1-5 (corresponding to products in products.txt)

```
1, Annie, E,  1,  1,  1,  1,  1
2, Betty, S,  2,  2,  2,  2,  2
3, Cathy, E,  0, 10,  0, 10,  0
4, Annie, E,  5,  5,  5,  5,  5
5, David, S,  1,  1, 10,  1, 10
6, Ellen, E,  0,  2,  0, 10, 10
7, David, S, 10,  4,  0,  0,  4
8, Annie, S,  0,  0, 10,  0, 10
...
```

Lines that contain identical names are ordered by the same customers. E.g. in order #8, Annie buys 10 power banks and 10 wireless mouses with standard shipping. Orders #1, #4, #8 are from the same person (Annie).

Don't hard code order information. I may change customer names, shipping types, or number of products to check whether your calculation is correct. I may also add or remove some lines (number of lines is not fixed).

Your class must have method **process** to process each order as follows:

3.1 Calculate total price and total weight of all products

3.2 Calculate shipping fee according to conditions in (4)

3.3 Check customer's cashback
- If this is the customer's first order, add him/her to customer list. Set cashback = 0
- If this customer already exists, get available cashback. Cashback redemption is limited to 100 baht per order

3.4 Calculate total bill = total price + shipping fee – cashback redemption ; redemption <= 100

3.5 Update customer's cashback for the next order
- After redemption in (3.4)
- Add cashback earned by the current order = 0.01 * total price. Cashback <1 full baht is excluded
- E.g. total price = 5260 ➔ cashback = 52 baht

3.6 Design your own output format, but it must show at least: order information read from input file, total price, total weight, shipping fee, final bill, and cashback

4. Implement **class ShippingCalculator** to calculate shipping fee for the order in (3). Shipping rates are read from shipping.txt.

```
E, F,    0, 1000,  60
E, F, 1000, 1500,  80
E, F, 1500, 2000, 110
S, F,    0, 1000,  40
S, V, 1000,  100,   5
```

- Column 1 = shipping type (E = express, S = standard)
- Column 2 = fee type   (F = fixed, V = variable)
- Fixed fee   : columns 3, 4, 5 = min weight, max weight, fee
- Variable fee : columns 3, 4, 5 = surplus threshold, W, F

Again, don't hard code shipping rates. I may change weight limits or fees to check whether your calculation is correct. But there are always 3 fixed express rates, 1 fixed standard rate, 1 variable standard rate in this file.

Shipping fee is calculated from total weight as follows:

4.1 If the customer requests express shipping, check each express row
- If min weight < total weight <= max weight, get shipping fee from that row
- If total weight doesn't fall in any express row, use standard shipping instead
- E.g. total weight = 1200 ➔ fee = 80
- E.g. total weight = 2460 ➔ switch to standard shipping

4.2 If the customer requests or has to switch to standard shipping
- Fee = fixed fee for weight up to max weight + variable fee for surplus weight
- Variable fee = F baht for every W grams. If remaining weight < W, the fee is still F
- E.g. total weight = 2460
  Fee = 40 (for first 1000 grams) + 14*5 (for 1400 grams) + 5 (for 60 grams) = 115

5. Implement main class with main method
   5.1 Read data from input files
   5.2 Process each order
   5.3 Report all products and their total sales in cash & in units, sorted in decreasing order of sales in cash

6. The program must be able to handle the following errors/exceptions
   6.1 Missing files – if products.txt, orders.txt, or shipping.txt is missing

   6.2 Orders.txt may contain input errors as in orders_errors.txt, but no input error in the other files
   - Missing values, e.g. only 4 products instead of 5 products in a line
   - Format errors, e.g. "O (oh)" instead of "0 (zero)"
   - Invalid numbers, e.g. X for shipping, -5 for number of products

   You may handle these errors by:
   - Skipping the whole line. Skipped transactions must not be added to product sales.
   - Replacing them with some default values e.g. S for shipping, 0 for number of products.
   - All exception handling must be reported, so I can check whether your calculation is correct.

   6.3 Handling the above errors/exceptions means your program must be able to continue and give correct output. Printing messages and ending the program doesn't count as proper exception handling.

7. Package and folder structure must be correct
   7.1 Your source files (.java) must be in folder Project1_XXX where XXX = ID of the group representative, assuming that this folder is under Maven's "src/main/java" structure. The first lines of all source files must be comments containing names & IDs of all members.

   7.2 Input files must be read from Project1_XXX. Don't use absolute path that is valid only on your PC.
   7.3 Add readme.txt containing names & IDs of all members in Project1_XXX.

Submission

1. Group representative zips and submits Project1_XXX to Google classroom
2. Other members submit only readme.txt to Google classroom

Grading

4 points	requirements + correct results	(total price + weight, shipping fee, final bill, cashback)
1 point	correct summary report	(sorted product sales)
2 points	proper exception handling	(missing files, input errors)
3 points	proper design & programming in OOP style	

```
--- exec-maven-plugin:3.0.0:exec (default-cli) @ project1solution ---
Read products from file src/main/java/Project1/products.txt

Read shipping from file src/main/java/Project1/shipping.txt

Read orders from file src/main/java/Project1/orders.txt

===== Order Processing =====
Order  1 (express) , Annie >> Bluetooth Speaker ( 1)    External HDD ( 1)    Power Bank ( 1)    USB Hub ( 1)    Wireless Mouse ( 1)
                          >> Available cashback = 0
                          >> Total price  =  5,260
                          >> Total weight =  1,230      Shipping Fee =  80
                          >> Final bill   =  5,340      Cashback for next order = 52

Order  2 (standard), Betty >> Bluetooth Speaker ( 2)    External HDD ( 2)    Power Bank ( 2)    USB Hub ( 2)    Wireless Mouse ( 2)
                          >> Available cashback = 0
                          >> Total price  = 10,520
                          >> Total weight =  2,460      Shipping Fee = 115
                          >> Final bill   = 10,635      Cashback for next order = 105

Order  3 (express) , Cathy >> Bluetooth Speaker ( 0)    External HDD (10)    Power Bank ( 0)    USB Hub (10)    Wireless Mouse ( 0)
                          >> Available cashback = 0
                          >> Total price  = 34,500
                          >> Total weight =  2,500      Shipping Fee = 115   use standard shipping
                          >> Final bill   = 34,615      Cashback for next order = 345

Order  4 (express) , Annie >> Bluetooth Speaker ( 5)    External HDD ( 5)    Power Bank ( 5)    USB Hub ( 5)    Wireless Mouse ( 5)
                          >> Available cashback = 52
                          >> Total price  = 26,300
                          >> Total weight =  6,150      Shipping Fee = 300   use standard shipping
                          >> Final bill   = 26,548      Cashback for next order = 263

Order  5 (standard), David >> Bluetooth Speaker ( 1)    External HDD ( 1)    Power Bank (10)    USB Hub ( 1)    Wireless Mouse (10)
                          >> Available cashback = 0
                          >> Total price  = 17,050
                          >> Total weight =  5,100      Shipping Fee = 245
                          >> Final bill   = 17,295      Cashback for next order = 170

Order  6 (express) , Ellen >> Bluetooth Speaker ( 0)    External HDD ( 2)    Power Bank ( 0)    USB Hub (10)    Wireless Mouse (10)
                          >> Available cashback = 0
                          >> Total price  = 20,300
                          >> Total weight =  1,720      Shipping Fee = 110
                          >> Final bill   = 20,410      Cashback for next order = 203

Order  7 (standard), David >> Bluetooth Speaker (10)    External HDD ( 4)    Power Bank ( 0)    USB Hub ( 0)    Wireless Mouse ( 4)
                          >> Available cashback = 170
                          >> Total price  = 16,240
                          >> Total weight =  6,700      Shipping Fee = 325
                          >> Final bill   = 16,465      Cashback for next order = 232

Order  8 (standard), Annie >> Bluetooth Speaker ( 0)    External HDD ( 0)    Power Bank (10)    USB Hub ( 0)    Wireless Mouse (10)
                          >> Available cashback = 263
                          >> Total price  = 13,100
                          >> Total weight =  4,300      Shipping Fee = 205
                          >> Final bill   = 13,205      Cashback for next order = 294

Order  9 (standard), Cathy >> Bluetooth Speaker ( 5)    External HDD ( 0)    Power Bank ( 5)    USB Hub ( 0)    Wireless Mouse ( 5)
                          >> Available cashback = 345
                          >> Total price  =  9,050
                          >> Total weight =  4,900      Shipping Fee = 235
                          >> Final bill   =  9,185      Cashback for next order = 335

Order 10 (express) , Frodo >> Bluetooth Speaker ( 0)    External HDD ( 5)    Power Bank ( 0)    USB Hub ( 5)    Wireless Mouse ( 0)
                          >> Available cashback = 0
                          >> Total price  = 17,250
                          >> Total weight =  1,250      Shipping Fee =  80
                          >> Final bill   = 17,330      Cashback for next order = 172

Order 11 (standard), Ellen >> Bluetooth Speaker ( 5)    External HDD ( 5)    Power Bank ( 2)    USB Hub ( 2)    Wireless Mouse ( 2)
                          >> Available cashback = 203
                          >> Total price  = 19,070
                          >> Total weight =  4,740      Shipping Fee = 230
                          >> Final bill   = 19,200      Cashback for next order = 293

Order 12 (standard), Ginny >> Bluetooth Speaker (10)    External HDD (10)    Power Bank ( 1)    USB Hub ( 1)    Wireless Mouse (10)
                          >> Available cashback = 0
                          >> Total price  = 35,050
                          >> Total weight =  8,880      Shipping Fee = 435
                          >> Final bill   = 35,485      Cashback for next order = 350

===== Product Summary =====
External HDD        total sales =  105,750 baht,  45 units
USB Hub             total sales =   40,700 baht,  37 units
Power Bank          total sales =   30,600 baht,  36 units
Wireless Mouse      total sales =   27,140 baht,  59 units
Bluetooth Speaker   total sales =   19,500 baht,  39 units

------------------------------------------------------------------------
```

No error

```
--- exec-maven-plugin:3.0.0:exec (default-cli) @ project1solution ---
java.io.FileNotFoundException: src\main\java\Project1\product.txt (The system cannot find the file specified)
Enter file name for products =
pro
java.io.FileNotFoundException: src\main\java\Project1\pro (The system cannot find the file specified)
Enter file name for products =
products.txt
Read products from file src/main/java/Project1/products.txt

java.io.FileNotFoundException: src\main\java\Project1\shippings.txt (The system cannot find the file specified)
Enter file name for shipping =
ship
java.io.FileNotFoundException: src\main\java\Project1\ship (The system cannot find the file specified)
Enter file name for shipping =
shipping.txt
Read shipping from file src/main/java/Project1/shipping.txt

java.io.FileNotFoundException: src\main\java\Project1\order.txt (The system cannot find the file specified)
Enter file name for orders =
order_error
java.io.FileNotFoundException: src\main\java\Project1\order_error (The system cannot find the file specified)
Enter file name for orders =
orders_errors
java.io.FileNotFoundException: src\main\java\Project1\orders_errors (The system cannot find the file specified)
Enter file name for orders =
orders_errors.txt
Read orders from file src/main/java/Project1/orders_errors.txt

Project1.InvalidInputException: For input: x
[1, Annie,  x,  1,  1,  1,  1,  1]  --> skip this order

java.lang.ArrayIndexOutOfBoundsException: Index 7 out of bounds for length 7
[2, Betty,  S,  2,  2,  2,  2 ]  --> skip this order

java.lang.NumberFormatException: For input string: "1"
[5, David,  S,  1,  1, 10,  1, -10]  --> skip this order

Project1.InvalidInputException: For input: 5
[9, Cathy,      5,  0,  5,  0,  5]  --> skip this order

java.lang.NumberFormatException: For input string: "2.5"
[11, Ellen,  S,  5,  5,  2,  2,  2.5]  --> skip this order

java.lang.NumberFormatException: For input string: "1O"
[12, Ginny,  S, 1O, 10,  1,  1, 10]  --> skip this order
```

Missing file ➔ keep asking for a new file name

Input errors ➔ skip whole line

```
===== Order Processing =====
Order  3 (express) , Cathy >> Bluetooth Speaker ( 0)    External HDD (10)    Power Bank ( 0)    USB Hub (10)    Wireless Mouse ( 0)
                          >> Available cashback = 0
                          >> Total price  = 34,500
                          >> Total weight =  2,500      Shipping Fee = 115   use standard shipping
                          >> Final bill   = 34,615      Cashback for next order = 345

Order  4 (express) , Annie >> Bluetooth Speaker ( 5)    External HDD ( 5)    Power Bank ( 5)    USB Hub ( 5)    Wireless Mouse ( 5)
                          >> Available cashback = 0
                          >> Total price  = 26,300
                          >> Total weight =  6,150      Shipping Fee = 300   use standard shipping
                          >> Final bill   = 26,600      Cashback for next order = 263

Order  6 (express) , Ellen >> Bluetooth Speaker ( 0)    External HDD ( 2)    Power Bank ( 0)    USB Hub (10)    Wireless Mouse (10)
                          >> Available cashback = 0
                          >> Total price  = 20,300
                          >> Total weight =  1,720      Shipping Fee = 110
                          >> Final bill   = 20,410      Cashback for next order = 203

Order  7 (standard), David >> Bluetooth Speaker (10)    External HDD ( 4)    Power Bank ( 0)    USB Hub ( 0)    Wireless Mouse ( 4)
                          >> Available cashback = 0
                          >> Total price  = 16,240
                          >> Total weight =  6,700      Shipping Fee = 325
                          >> Final bill   = 16,565      Cashback for next order = 162

Order  8 (standard), Annie >> Bluetooth Speaker ( 0)    External HDD ( 0)    Power Bank (10)    USB Hub ( 0)    Wireless Mouse (10)
                          >> Available cashback = 263
                          >> Total price  = 13,100
                          >> Total weight =  4,300      Shipping Fee = 205
                          >> Final bill   = 13,205      Cashback for next order = 294

Order 10 (express) , Frodo >> Bluetooth Speaker ( 0)    External HDD ( 5)    Power Bank ( 0)    USB Hub ( 5)    Wireless Mouse ( 0)
                          >> Available cashback = 0
                          >> Total price  = 17,250
                          >> Total weight =  1,250      Shipping Fee =  80
                          >> Final bill   = 17,330      Cashback for next order = 172


===== Product Summary =====
External HDD        total sales =   61,100 baht,  26 units
USB Hub             total sales =   33,000 baht,  30 units
Wireless Mouse      total sales =   13,340 baht,  29 units
Power Bank          total sales =   12,750 baht,  15 units
Bluetooth Speaker   total sales =    7,500 baht,  15 units
```

```
--- exec-maven-plugin:3.0.0:exec (default-cli) @ project1solution ---
Read products from file src/main/java/Project1/products.txt

Read shipping from file src/main/java/Project1/shipping.txt

Read orders from file src/main/java/Project1/orders_errors.txt

Project1.InvalidInputException: For input: x
Original [1,  Annie,  x,  1,  1,  1,  1,  1]  --> Correction  [1, Annie, S,  1,  1,  1,  1,  1]

Project1.MissingInputException: 1 columns missing
Original [2,  Betty,  S,  2,  2,  2,  2 ]  --> Correction  [2, Betty, S,  2,  2,  2,  2,  0]

java.lang.NumberFormatException: For input string: "1"
Project1.InvalidInputException: For input: -10
Original [5,  David,  S,  1,  1, 10,  1, -10]  --> Correction  [5, David, S,  0,  1, 10,  1,  0]

Project1.InvalidInputException: For input: 5
Project1.MissingInputException: 1 columns missing
Original [9,  Cathy,    5,  0,  5,  0,  5]  --> Correction  [9, Cathy, S,  0,  5,  0,  5,  0]

java.lang.NumberFormatException: For input string: "2.5"
Original [11, Ellen,  S,  5,  5,  2,  2, 2.5]  --> Correction  [11, Ellen, S,  5,  5,  2,  2,  0]

java.lang.NumberFormatException: For input string: "10"
Original [12, Ginny,  S, 10, 10,  1,  1, 10]  --> Correction  [12, Ginny, S,  0, 10,  1,  1, 10]
```

Input errors ➜ use default values

```
===== Order Processing =====
Order  1 (standard), Annie >> Bluetooth Speaker ( 1)    External HDD ( 1)    Power Bank ( 1)    USB Hub ( 1)    Wireless Mouse ( 1)
                           >> Available cashback = 0
                           >> Total price  =  5,260
                           >> Total weight =  1,230       Shipping Fee =  55
                           >> Final bill   =  5,315       Cashback for next order = 52

Order  2 (standard), Betty >> Bluetooth Speaker ( 2)    External HDD ( 2)    Power Bank ( 2)    USB Hub ( 2)    Wireless Mouse ( 0)
                           >> Available cashback = 0
                           >> Total price  =  9,600
                           >> Total weight =  2,280       Shipping Fee = 105
                           >> Final bill   =  9,705       Cashback for next order = 96

Order  3 (express) , Cathy >> Bluetooth Speaker ( 0)    External HDD (10)    Power Bank ( 0)    USB Hub (10)    Wireless Mouse ( 0)
                           >> Available cashback = 0
                           >> Total price  = 34,500
                           >> Total weight =  2,500       Shipping Fee = 115    use standard shipping
                           >> Final bill   = 34,615       Cashback for next order = 345

Order  4 (express) , Annie >> Bluetooth Speaker ( 5)    External HDD ( 5)    Power Bank ( 5)    USB Hub ( 5)    Wireless Mouse ( 5)
                           >> Available cashback = 52
                           >> Total price  = 26,300
                           >> Total weight =  6,150       Shipping Fee = 300    use standard shipping
                           >> Final bill   = 26,548       Cashback for next order = 263

Order  5 (standard), David >> Bluetooth Speaker ( 0)    External HDD ( 1)    Power Bank (10)    USB Hub ( 1)    Wireless Mouse ( 0)
                           >> Available cashback = 0
                           >> Total price  = 11,950
                           >> Total weight =  3,650       Shipping Fee = 175
                           >> Final bill   = 12,125       Cashback for next order = 119

Order  6 (express) , Ellen >> Bluetooth Speaker ( 0)    External HDD ( 2)    Power Bank ( 0)    USB Hub (10)    Wireless Mouse (10)
                           >> Available cashback = 0
                           >> Total price  = 20,300
                           >> Total weight =  1,720       Shipping Fee = 110
                           >> Final bill   = 20,410       Cashback for next order = 203

Order  7 (standard), David >> Bluetooth Speaker (10)    External HDD ( 4)    Power Bank ( 0)    USB Hub ( 0)    Wireless Mouse ( 4)
                           >> Available cashback = 119
                           >> Total price  = 16,240
                           >> Total weight =  6,700       Shipping Fee = 325
                           >> Final bill   = 16,465       Cashback for next order = 181

Order  8 (standard), Annie >> Bluetooth Speaker ( 0)    External HDD ( 0)    Power Bank (10)    USB Hub ( 0)    Wireless Mouse (10)
                           >> Available cashback = 263
                           >> Total price  = 13,100
                           >> Total weight =  4,300       Shipping Fee = 205
                           >> Final bill   = 13,205       Cashback for next order = 294

Order  9 (standard), Cathy >> Bluetooth Speaker ( 0)    External HDD ( 5)    Power Bank ( 0)    USB Hub ( 5)    Wireless Mouse ( 0)
                           >> Available cashback = 345
                           >> Total price  = 17,250
                           >> Total weight =  1,250       Shipping Fee =  55
                           >> Final bill   = 17,205       Cashback for next order = 417

Order 10 (express) , Frodo >> Bluetooth Speaker ( 0)    External HDD ( 5)    Power Bank ( 0)    USB Hub ( 5)    Wireless Mouse ( 0)
                           >> Available cashback = 0
                           >> Total price  = 17,250
                           >> Total weight =  1,250       Shipping Fee =  80
                           >> Final bill   = 17,330       Cashback for next order = 172

Order 11 (standard), Ellen >> Bluetooth Speaker ( 5)    External HDD ( 5)    Power Bank ( 2)    USB Hub ( 2)    Wireless Mouse ( 0)
                           >> Available cashback = 203
                           >> Total price  = 18,150
                           >> Total weight =  4,560       Shipping Fee = 220
                           >> Final bill   = 18,270       Cashback for next order = 284

Order 12 (standard), Ginny >> Bluetooth Speaker ( 0)    External HDD (10)    Power Bank ( 1)    USB Hub ( 1)    Wireless Mouse (10)
                           >> Available cashback = 0
                           >> Total price  = 30,050
                           >> Total weight =  3,380       Shipping Fee = 160
                           >> Final bill   = 30,210       Cashback for next order = 300


===== Product Summary =====
External HDD        total sales = 117,500 baht,  50 units
USB Hub             total sales =  46,200 baht,  42 units
Power Bank          total sales =  26,350 baht,  31 units
Wireless Mouse      total sales =  18,400 baht,  40 units
Bluetooth Speaker   total sales =  11,500 baht,  23 units
```