

EGCI 213
Group Project 1 – Event Package Booking

The project can be done in a group of ≤ 5 students. Each group must do the project by themselves:

- **Everyone involved in cheating, either as source or copier, will get ZERO point.**
- If late submitting group copies code from a graded group, the graded group will still be penalized.
- If I suspect that you don't do the project all by yourself (taking code from ChatGPT is counted as not doing the project by yourself), I may ask you to do programming quizzes about the suspicious points in person.

1. Implement **class Item** representing an individual item (room or meal) read from **items.txt**. The first line of the file = column descriptions. You may also implement child classes e.g. **Room** and **Meal** as their unit prices will be handled differently.

- Room: unit price (per day) is without service charge and VAT.

Service charge = 10% of unit price

VAT = 7% of price including service charge

- Meal: unit price (per person) already includes VAT.

- Don't hard code item information. I may change names or prices when grading. But there are always 3 types of rooms and 3 types of meals.

code,	name,	unit price
R1,	Meeting Room Small,	8000
R2,	Meeting Room Medium,	11000
R3,	Meeting Room Large,	18000
M1,	Coffee Break,	100
M2,	Lunch,	450
M3,	Dinner,	600

2. Implement **class Customer** representing an individual customer. Customer ID are read from **bookings.txt**. Your class may have an `ArrayList<Booking>` to keep all bookings made by each customer.

3. Implement **class Booking** representing an individual booking read from **bookings.txt**. The first line of the file = column descriptions.

booking,	customer,	days,	rooms/day(R1:R2:R3),	persons,	meals/person/day(M1:M2:M3)
B1,	C1,	3,	3:0:0,	100,	2:1:0
B2,	C1,	1,	0:0:0,	100,	0:0:1
B3,	C2,	6,	2:2:0,	120,	0:0:0
B4,	C3,	2,	0:0:1,	50,	1:0:1
B5,	C4,	5,	5:0:2,	300,	2:1:1
B6,	C5,	10,	1:1:1,	80,	1:1:1

To process each booking:

3.1 Calculate total room price (with service charge & VAT) for all days. For example:

In B6: 1 small room + 1 medium room + 1 large room are booked for 10 days.

3.2 Calculate total meal price for all persons for all days. For example:

In B6: 1 coffee break + 1 lunch + 1 dinner are booked for each person in each day.

Calculate the total for 80 persons for 10 days.

3.3 Calculate sub-total from 3.1 + 3.2. This amount will be used in summary processing (see 5.3).

3.4 Calculate discount (see 4) and total price after discount.

3.5 Show output as in the demo.

- Don't hard code booking information. I may change values in some columns when grading. I may also add or remove a few bookings (#bookings is not fixed). But there are always 3 types of rooms and 3 types of meals whose order match the order in items.txt.

4. Implement another class to **handle Discount criteria**. You can make your class represent either an individual criterion or all criteria offered by the hotel. Available criteria are read from **discounts.txt**. The first line of the file = column descriptions.

min	sub-total,	discount %
100000,		2.5
500000,		5
1000000,		10

- Don't hard code discount information. I may change values in some columns when grading. I may also add or remove a few criteria (#criteria is not fixed).
5. Implement main class with main method.
- 5.1 Read data from all input files.
 - 5.2 **Process each booking** (put calculation details in appropriate classes): see 3.1 – 3.5
 - 5.3 **Report customer summary** (put calculation details in appropriate classes):
 - For each customer, report all booking IDs of this customer and total booking amount (= sum of sub-total before discount from 3.3).
 - Customers must be sorted in decreasing order of their total amount. In case of equal total amount, simply sort them by customer ID.
6. The program must be able to handle the following errors/exceptions.
- 6.1 **Missing files** – if any input file is missing. For all input files, don't remove the first lines but skip them when reading the files.
 - 6.2 There may be input errors in bookings.txt as in **bookings_errors.txt**, but no input error in other files.
 - Missing values in some columns.
 - Format errors, e.g. "O (oh)" instead of "0 (zero)".
 - Invalid values, e.g. double or negative value for #days, #persons, #rooms, #meals.You may handle these errors by:
 - Skipping the whole line. If exceptions are due to invalid or missing values. Values in the skipped lines must not be added in the calculation.
 - Exceeding columns, zero counts (e.g. #days), or non-conforming IDs that don't cause exception or wrong calculation can just be ignored. Lines containing these can be treated as normal lines.
 - All exceptions 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 = full 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

- 3 points requirements + correct results (room price, meal price, sub-total, discount, total)
- 1.5 points correct summary reports (sorted customers, booking IDs, total booking)
- 1.5 points proper exception handling (missing files, input errors)
- 4 points proper design & programming in OOP style

Late submission: -0.5 points for <1 week late; -1 point for each 1 full week late

```
Read from src/main/java/Project1/items.txt
```

```
R1, Meeting Room Small    rate (per day) = 8,000.00    rate++ = 9,416.00
R2, Meeting Room Medium  rate (per day) = 11,000.00   rate++ = 12,947.00
R3, Meeting Room Large   rate (per day) = 18,000.00   rate++ = 21,186.00
```

Demo 1: no exception

```
M1, Coffee Break    rate (per person per day) = 100.00
M2, Lunch           rate (per person per day) = 450.00
M3, Dinner          rate (per person per day) = 600.00
```

```
Read from src/main/java/Project1/discounts.txt
```

```
If total bill >= 1,000,000 discount = 10.0%
If total bill >= 500,000 discount = 5.0%
If total bill >= 100,000 discount = 2.5%
```

```
Read from src/main/java/Project1/bookings.txt
```

```
===== Booking Processing =====
```

```
Booking B1, customer C1 >> days = 3, persons = 100, rooms = [3, 0, 0], meals = [2, 1, 0]
    total room price++ = 84,744.00
    total meal price = 195,000.00
    sub-total = 279,744.00
    discount 2.5% = 6,993.60
    total = 272,750.40
```

```
Booking B2, customer C1 >> days = 1, persons = 100, rooms = [0, 0, 0], meals = [0, 0, 1]
    total room price++ = 0.00
    total meal price = 60,000.00
    sub-total = 60,000.00
    discount = 0.00
    total = 60,000.00
```

```
Booking B3, customer C2 >> days = 6, persons = 120, rooms = [2, 2, 0], meals = [0, 0, 0]
    total room price++ = 268,356.00
    total meal price = 0.00
    sub-total = 268,356.00
    discount 2.5% = 6,708.90
    total = 261,647.10
```

```
Booking B4, customer C3 >> days = 2, persons = 50, rooms = [0, 0, 1], meals = [1, 0, 1]
    total room price++ = 42,372.00
    total meal price = 70,000.00
    sub-total = 112,372.00
    discount 2.5% = 2,809.30
    total = 109,562.70
```

```
Booking B5, customer C4 >> days = 5, persons = 300, rooms = [5, 0, 2], meals = [2, 1, 1]
    total room price++ = 447,260.00
    total meal price = 1,875,000.00
    sub-total = 2,322,260.00
    discount 10.0% = 232,226.00
    total = 2,090,034.00
```

```
Booking B6, customer C5 >> days = 10, persons = 80, rooms = [1, 1, 1], meals = [1, 1, 1]
    total room price++ = 435,490.00
    total meal price = 920,000.00
    sub-total = 1,355,490.00
    discount 10.0% = 135,549.00
    total = 1,219,941.00
```

```
Booking B7, customer C6 >> days = 4, persons = 250, rooms = [4, 2, 0], meals = [1, 1, 0]
    total room price++ = 254,232.00
    total meal price = 550,000.00
    sub-total = 804,232.00
    discount 5.0% = 40,211.60
    total = 764,020.40
```

```

Booking B8, customer C3 >> days = 10, persons = 20, rooms = [1, 0, 0], meals = [2, 0, 0]
    total room price++ = 94,160.00
    total meal price = 40,000.00
    sub-total = 134,160.00
    discount 2.5% = 3,354.00
    total = 130,806.00

Booking B9, customer C7 >> days = 1, persons = 150, rooms = [0, 2, 1], meals = [2, 0, 0]
    total room price++ = 47,080.00
    total meal price = 30,000.00
    sub-total = 77,080.00
    discount = 0.00
    total = 77,080.00

Booking B10, customer C7 >> days = 1, persons = 150, rooms = [1, 0, 1], meals = [0, 1, 0]
    total room price++ = 30,602.00
    total meal price = 67,500.00
    sub-total = 98,102.00
    discount = 0.00
    total = 98,102.00

Booking B11, customer C4 >> days = 3, persons = 80, rooms = [0, 2, 1], meals = [2, 1, 0]
    total room price++ = 141,240.00
    total meal price = 156,000.00
    sub-total = 297,240.00
    discount 2.5% = 7,431.00
    total = 289,809.00

Booking B12, customer C2 >> days = 2, persons = 300, rooms = [0, 0, 0], meals = [0, 1, 1]
    total room price++ = 0.00
    total meal price = 630,000.00
    sub-total = 630,000.00
    discount 5.0% = 31,500.00
    total = 598,500.00

Booking B13, customer C1 >> days = 5, persons = 100, rooms = [0, 3, 0], meals = [0, 0, 0]
    total room price++ = 194,205.00
    total meal price = 0.00
    sub-total = 194,205.00
    discount 2.5% = 4,855.13
    total = 189,349.88

Booking B14, customer C8 >> days = 5, persons = 200, rooms = [0, 0, 0], meals = [2, 0, 0]
    total room price++ = 0.00
    total meal price = 200,000.00
    sub-total = 200,000.00
    discount 2.5% = 5,000.00
    total = 195,000.00

Booking B15, customer C6 >> days = 2, persons = 120, rooms = [0, 3, 0], meals = [3, 0, 0]
    total room price++ = 77,682.00
    total meal price = 72,000.00
    sub-total = 149,682.00
    discount 2.5% = 3,742.05
    total = 145,939.95

Booking B16, customer C8 >> days = 8, persons = 60, rooms = [2, 1, 0], meals = [0, 1, 0]
    total room price++ = 254,232.00
    total meal price = 216,000.00
    sub-total = 470,232.00
    discount 2.5% = 11,755.80
    total = 458,476.20

Booking B17, customer C3 >> days = 1, persons = 30, rooms = [0, 1, 0], meals = [1, 0, 0]
    total room price++ = 12,947.00
    total meal price = 3,000.00
    sub-total = 15,947.00
    discount = 0.00
    total = 15,947.00

Booking B18, customer C7 >> days = 3, persons = 30, rooms = [2, 0, 0], meals = [2, 1, 1]
    total room price++ = 56,496.00
    total meal price = 112,500.00
    sub-total = 168,996.00
    discount 2.5% = 4,224.90
    total = 164,771.10

Booking B19, customer C2 >> days = 4, persons = 100, rooms = [1, 0, 2], meals = [2, 0, 0]
    total room price++ = 207,152.00
    total meal price = 80,000.00
    sub-total = 287,152.00
    discount 2.5% = 7,178.80
    total = 279,973.20

```

```

Booking B20, customer C5 >> days = 1, persons = 10, rooms = [1, 0, 0], meals = [3, 1, 1]
    total room price++ = 9,416.00
    total meal price = 13,500.00
    sub-total = 22,916.00
    discount = 0.00
    total = 22,916.00

```

===== Customer Summary =====

```

C4 >> total amount = 2,619,500.00 bookings = [B5 , B11]
C5 >> total amount = 1,378,406.00 bookings = [B6 , B20]
C2 >> total amount = 1,185,508.00 bookings = [B3 , B12, B19]
C6 >> total amount = 953,914.00 bookings = [B7 , B15]
C8 >> total amount = 670,232.00 bookings = [B14, B16]
C1 >> total amount = 533,949.00 bookings = [B1 , B2 , B13]
C7 >> total amount = 344,178.00 bookings = [B9 , B10, B18]
C3 >> total amount = 262,479.00 bookings = [B4 , B8 , B17]

```

```

java.io.FileNotFoundException: src\main\java\Project1\item.txt (The system cannot find the file spe
Enter correct file name =
items

```

Demo 2: with exceptions

```

java.io.FileNotFoundException: src\main\java\Project1\items (The system cannot find the file specif
Enter correct file name =
items.txt

```

Read from src/main/java/Project1/items.txt

```

R1, Meeting Room Small    rate (per day) = 8,000.00    rate++ = 9,416.00
R2, Meeting Room Medium   rate (per day) = 11,000.00    rate++ = 12,947.00
R3, Meeting Room Large    rate (per day) = 18,000.00    rate++ = 21,186.00

```

```

M1, Coffee Break    rate (per person per day) = 100.00
M2, Lunch           rate (per person per day) = 450.00
M3, Dinner          rate (per person per day) = 600.00

```

```

java.io.FileNotFoundException: src\main\java\Project1\discount.txt (The system cannot find the file
Enter correct file name =
disc.txt

```

Missing files handling

```

java.io.FileNotFoundException: src\main\java\Project1\disc.txt (The system cannot find the file spe
Enter correct file name =
discounts

```

```

java.io.FileNotFoundException: src\main\java\Project1\discounts (The system cannot find the file sp
Enter correct file name =
discounts.txt

```

Read from src/main/java/Project1/discounts.txt

```

If total bill >= 1,000,000    discount = 10.0%
If total bill >= 500,000     discount = 5.0%
If total bill >= 100,000     discount = 2.5%

```

```

java.io.FileNotFoundException: src\main\java\Project1\bookings_error.txt (The system cannot find th
Enter correct file name =
bookings_errors.txt

```

Read from src/main/java/Project1/bookings_errors.txt

```

Project1.InvalidInputException: For days: "-3"
B1,    C1,    -3,    3:0:0,    100,    2:1:0    skip

```

```

Project1.InvalidInputException: For rooms: "0;0;0"
B2,    C1,    1,    0;0;0,    -100,    0:0:1    skip

```

```

java.lang.NumberFormatException: For input string: "120"
B3,    C2,    6,    2:2:0,    120,    0:0:0    skip

```

```

Project1.InvalidInputException: For room: "-1"
B4,    C3,    2,    0:0:-1,    50,    1:0:1    skip

```

```

Project1.InvalidInputException: For rooms: "5:0"
B5,    C4,    5,    5:0,    300,    2:1:1    skip

```

```

Project1.InvalidInputException: For meals: "1-1-1"
B6,    C5,    10,    1:1:1,    80,    1-1-1    skip

```

```

Project1.InvalidInputException: For rooms: "4.2:0"
B7,    C6,    4,    4.2:0,    250,    1:1:0    skip

```

Input errors handling

```

java.lang.NumberFormatException: For input string: "2:0:0"
B8,      C3,      10,      1:0:0,      2:0:0      skip

java.lang.NumberFormatException: For input string: "0.5"
B9,      C7,      0.5,      0:2:1,      150,      2:0:0      skip

java.lang.NumberFormatException: For input string: "1.50"
B10,     C7,      1,      1:0:1,      1.50,      0:1:0      skip

===== Booking Processing =====
Booking Bxx, customer C4 >> days = 3, persons = 80, rooms = [0, 2, 1], meals = [2, 1, 0]
    total room price++ = 141,240.00
    total meal price   = 156,000.00
    sub-total          = 297,240.00
    discount 2.5%      = 7,431.00
    total              = 289,809.00

Booking B12, customer C2 >> days = 2, persons = 300, rooms = [0, 0, 0], meals = [0, 1, 1]
    total room price++ = 0.00
    total meal price   = 630,000.00
    sub-total          = 630,000.00
    discount 5.0%      = 31,500.00
    total              = 598,500.00

Booking B13, customer C** >> days = 5, persons = 100, rooms = [0, 3, 0], meals = [0, 0, 0]
    total room price++ = 194,205.00
    total meal price   = 0.00
    sub-total          = 194,205.00
    discount 2.5%      = 4,855.13
    total              = 189,349.88

Booking B14, customer C8 >> days = 5, persons = 200, rooms = [0, 0, 0], meals = [2, 0, 0]
    total room price++ = 0.00
    total meal price   = 200,000.00
    sub-total          = 200,000.00
    discount 2.5%      = 5,000.00
    total              = 195,000.00

Booking B15, customer C6 >> days = 2, persons = 120, rooms = [0, 3, 0], meals = [3, 0, 0]
    total room price++ = 77,682.00
    total meal price   = 72,000.00
    sub-total          = 149,682.00
    discount 2.5%      = 3,742.05
    total              = 145,939.95

```

Bookings 16 - 19 are the same as in Demo 1

```

Booking B20, customer C5 >> days = 1, persons = 10, rooms = [1, 0, 0], meals = [3, 1, 1]
    total room price++ = 9,416.00
    total meal price   = 13,500.00
    sub-total          = 22,916.00
    discount           = 0.00
    total              = 22,916.00

```

===== Customer Summary =====

```

C2 >> total amount = 917,152.00 bookings = [B12, B19]
C8 >> total amount = 670,232.00 bookings = [B14, B16]
C4 >> total amount = 297,240.00 bookings = [Bxx]
C** >> total amount = 194,205.00 bookings = [B13]
C7 >> total amount = 168,996.00 bookings = [B18]
C6 >> total amount = 149,682.00 bookings = [B15]
C5 >> total amount = 22,916.00 bookings = [B20]
C3 >> total amount = 15,947.00 bookings = [B17]

```

Values from skipped lines are excluded