EGCO 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 a source or copier, will get ZERO point.**
- If late submitting group copies code from a graded group, the graded group will still be penalized.
- **In case of AI usage, you must write your own prompts and perform your own acquisition with the AI.** Due to the dynamic nature of generative AI, it is very unlikely that any 2 groups will get identical generated code even when using identical prompts.
  - Therefore, submitting identical code will be counted as cheating.
  - Don't use generated content obtained by other groups as your own.
  - Don't share generated content you get from the AI with other groups.
  - If any suspicious arises, I may ask both groups to show their chat history with the AI. Failure to do so will result in cheating penalty.
- And remember, you must be able to orally explain every line of the code you submit, regardless of its origin.

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.

```
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
```

- 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.

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.

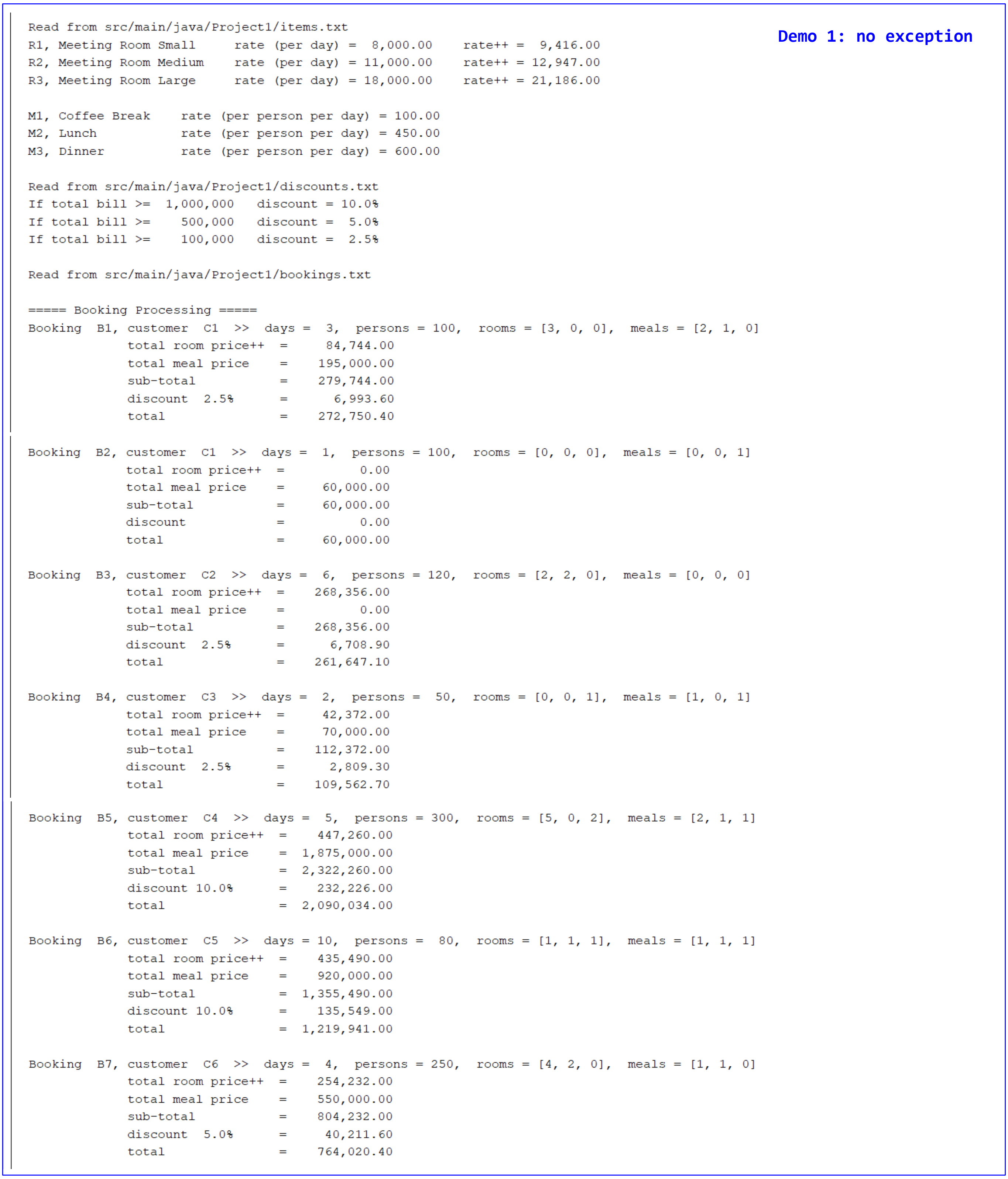
Submission

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

Grading

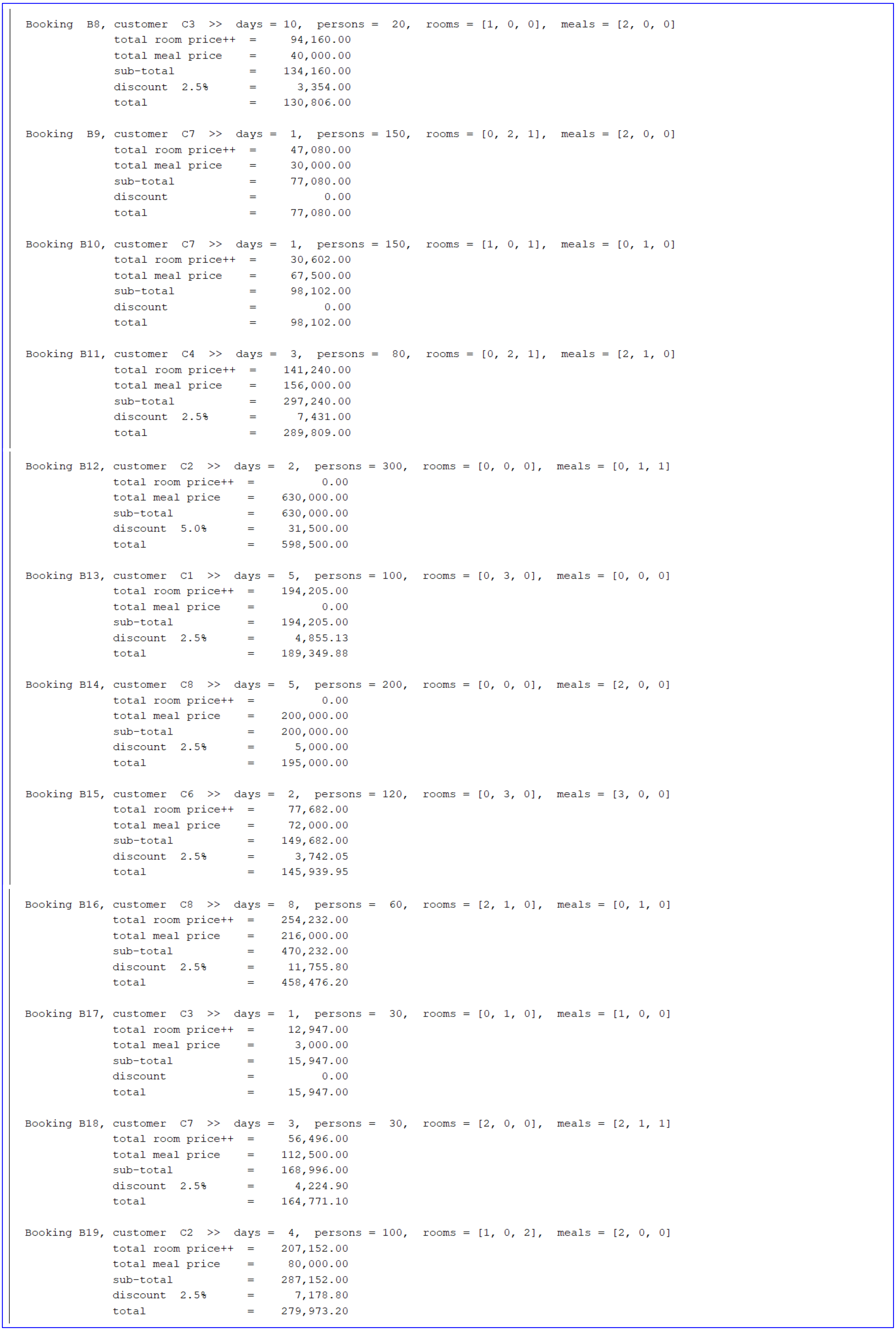
3	points	requirements + correct results	(room price, meal price, sub-total, discount, total)
1.5	points	correct summary reports	(sorted customers, booking IDs, total booking)
1.5	points	proper exception handling	(missing files, input errors)
4	points	proper design & programming in OOP style	

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

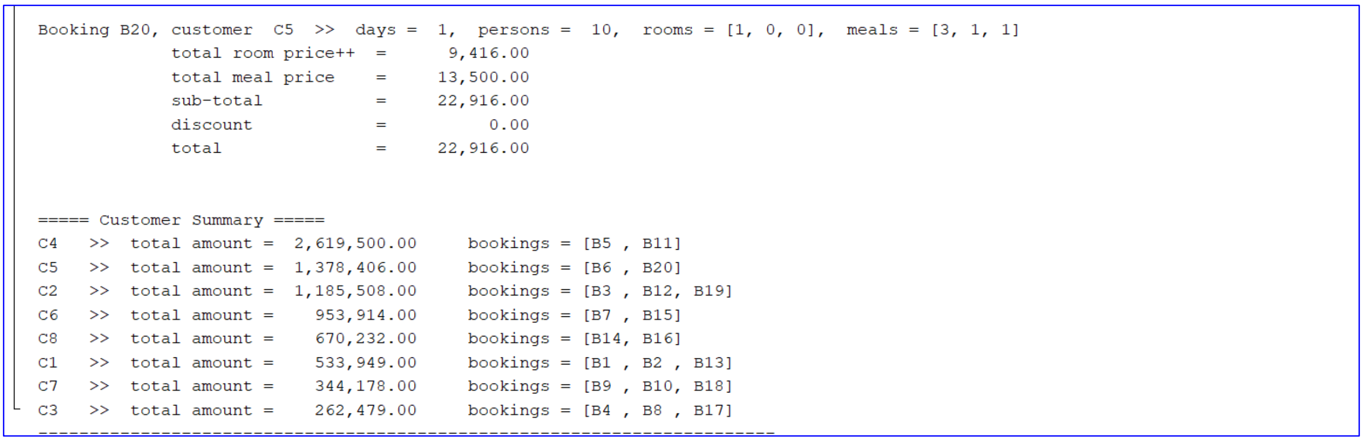


Demo 1: no exception

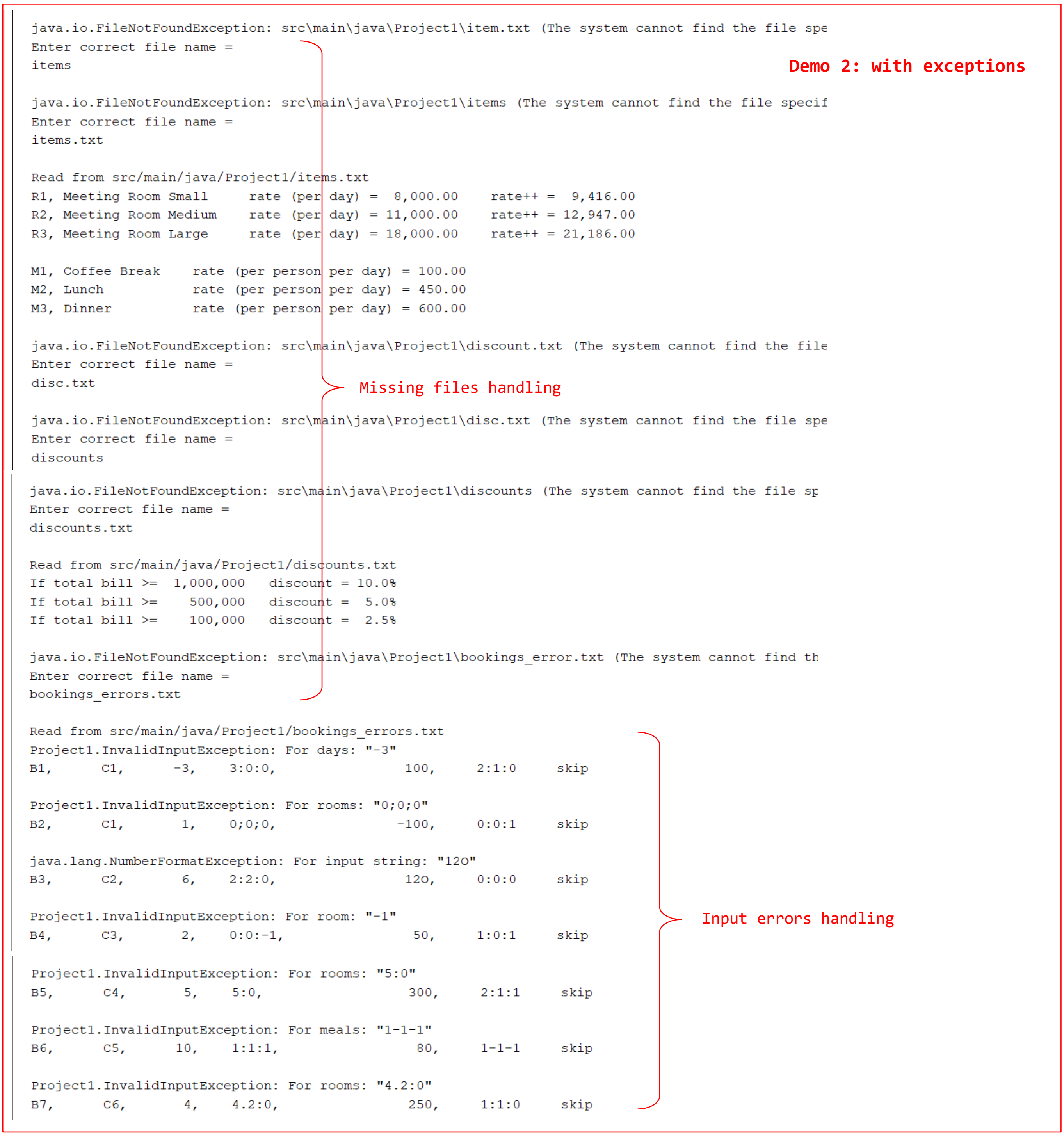
```
Read from src/main/java/Project1/items.txt
R1, Meeting Room Small      rate  (per day) =  8,000.00     rate++ =  9,416.00
R2, Meeting Room Medium     rate  (per day) = 11,000.00     rate++ = 12,947.00
R3, Meeting Room Large      rate  (per day) = 18,000.00     rate++ = 21,186.00

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

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]
------------------------------------------------------------------------
```

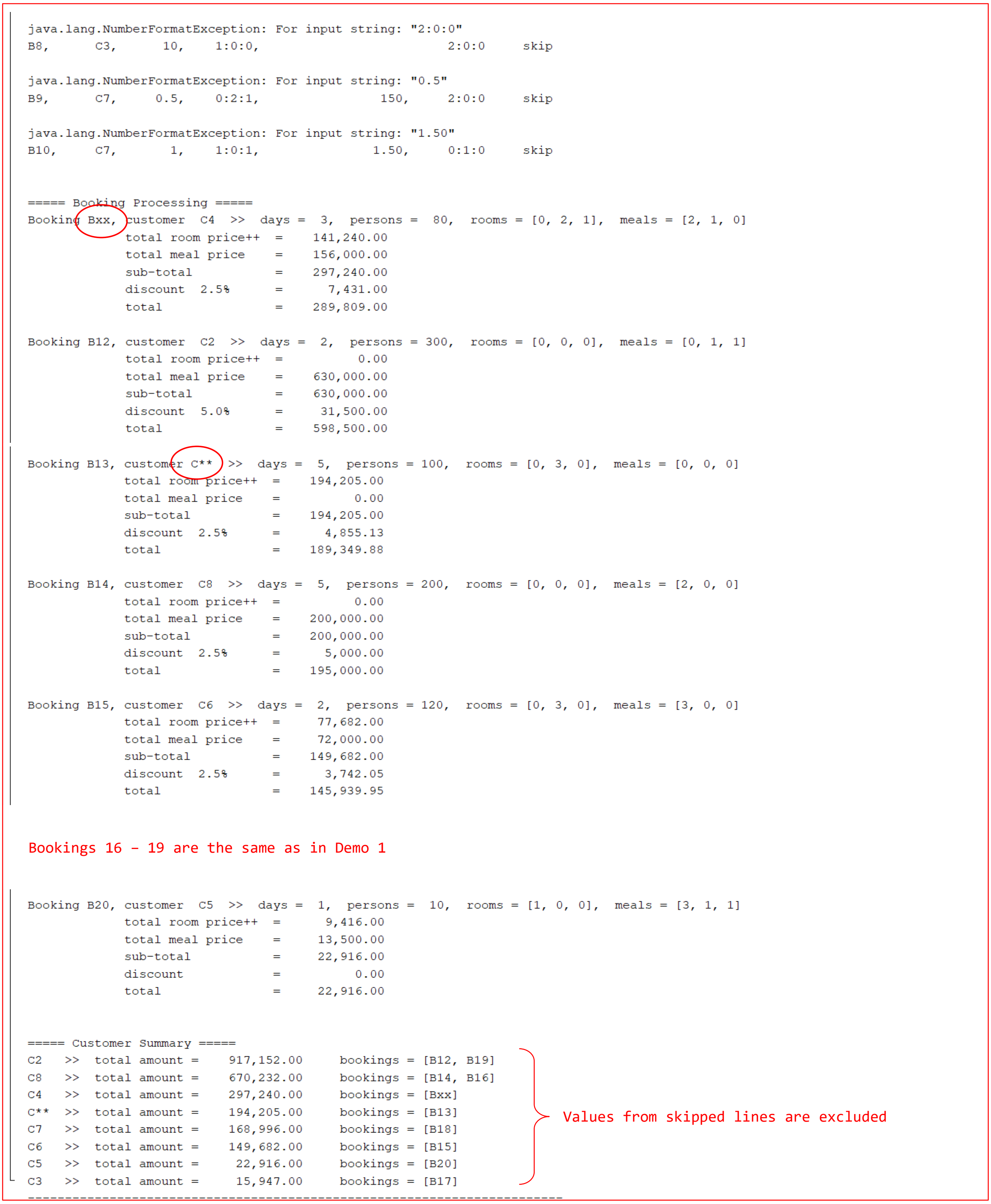


Demo 2: with exceptions

Missing files handling

Input errors handling

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

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

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: "12O"
B3,      C2,        6,    2:2:0,                12O,     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
```



```
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