SdPd/java Lab Exam 1

Objective: Carpet Fit Galway Quotations

Carpet Fit Galway costs are based on a callout fee, the number of rooms carpeted, room size, carpet grade, underlay and gripper costs less discount plus Vat as shown below.

Callout fee once off fixed charge	€ 50.00
Carpet Grade: A B C D	**Sq Meter Rate:** € 10.00 € 5.00 € 2.50 € 1.00
Off-cuts:	€ 3.50 **each**
Underlay Grade: 0 1 2	**Sq Meter Rate:** none € 2.50 € 5.00
Grippers: **Y**(es)/**N**(o)	**Meter Rate:** € 1.25
Discount: 2% per room excluding first room (max of 10%)	1 room – 0 % 2 rooms – 2 % 3 rooms – 4 % 5 rooms – 8 % > 5 rooms – 10 %
VAT/Tax Rate	20.00 %

Sample Line Input:

- Length   Width   Grade   Off-cuts   Underlay   Grippers
- double   double   char   int   int   char
- 3.5   2.1   A   2   0   Y

Line Input Explained:

- Le/ngth   – the room length (double)
- Wi/dth   – the room width (double)
- Gra/de   – the carpet grade (char) – either A, B, C or D
- Of/f-cuts   – the number of carpet cut outs or off-cuts (int) – may be 0
- Un/derlay   – carpet underlay type (int) – either 0, 1 or 2
- Gri/ppers   – whether carpet grippers are required (char) – Y/yes or N/no

Write a java program to calculate carpeting quotation costs for Carpet Fit Galway.

1. **Download** the lab exam 1 **zip** file and extract the folder, **Saved** on the desktop (**not** on your Network account or USB)
   – Rename the **LastNameFirstNameLabEx1** folder & java file as per your own name
   – E.g. **AgnewGerryLabEx1** folder and **AgnewGerryLabEx1**.java program file
   – To be **verified** by your lab supervisor

2. Add your **Program Id, Name** and **Program Description** as java comments

3. Remember to rename the starter **class name** as per your java program file name and **Save, Compile and Run** the program **before** you write any code
   – Alert your supervisor if the program does not run initially

4. **10%** of the Lab Exam marks are for the Algorithm form (enter your name at the top of the first page) which must be submitted at the end of the lab exam

5. **Warning:** marks will be deducted for **bad programming practices** such as:
   – Lacking meaningful variable names, white-space, indentation, etc.
   – Ensure redundant code is deleted prior to program submission
   – Ensure that non-working code is commented out prior to program submission

6. **Constants:**
   Declare the 10+ necessary constants as appropriate with meaningful names/types

7. **Variables:**
   Declare any necessary variables as appropriate with meaningful names/types

8. **Initialise:**
   Initialise any necessary variables (not all the variables)

9. **Preliminary Input**:
   Allow the user to enter the number of rooms to be carpeted, via the keyboard, which can vary from job to job (see the page 4 screenshot)

10. **Line Input** (inside the **for** loop):
    – Allow the user to enter carpeting details, via the keyboard, on the same input line
    – See Sample Line Input, Line Input Explained on page 1 and the page 4 screenshot

11. **Calculations:**
    Calculate the cost of carpeting each room based on the callout fee, the room size, the carpet grade, the number of off-cuts(if any), underlay required (if any), grippers required (if any), less the discount (if any) plus VAT according to the table on page 1

    – Calculate the Carpet area as the room length times room width and calculate the Carpet cost as the room area times the carpet grade cost
    – Calculate the Off-cut cost as the number of off-cuts times the off-cut rate
    – Calculate the Underlay cost as the room area times the underlay grade cost
    – Calculate the Gripper cost as the room perimeter (length + width * 2) times the gripper length per metre cost
    – The Callout fee is a once off room 1 cost only and not charged on subsequent rooms
    – Calculate the Gross cost by summing the:
        Callout fee (room 1 only), Carpet cost, Off-cut cost, Underlay cost & the Gripper cost
    – Calculate the Discount based on the number of rooms carpeted (max 10%)
    – Calculate the Net cost based on the Gross cost less Discount
    – Calculate the Value Added Tax (VAT) using the VAT rate provided
    – Calculate the Final Room carpeting cost based on the Net cost plus VAT

12. **Selection – Carpet grade cost (using an if/else/if):**
    Calculate the carpet grade cost based on the room area according to the carpet grade provided (A, B, C or D) and the associated cost per square meter

13. **Selection – carpet Underlay cost (if or if/else/if):**
    Calculate the carpet Underlay cost based on the room area according to the underlay grade provided (1 or 2) and the associated cost per square meter where applicable otherwise 0

14. **Selection – discount (if/else/if):**
    Calculate the Discount cost based on the Discount rate and Gross cost according to the number of rooms carpeted as indicated in the table on page 1 subject to a maximum of 10% (where is the best place to calculate the discount rate?)

15. **Line Output –** both unformatted and formatted versions required**:**
    – Output the room number and carpeting costs as shown initially unformatted/println ( ) and then formatted/printf ( ) for each room carpeted
    – Comment out the unformatted version when you get the formatted one working
    – See the page 4 screenshot

16. **Header Output:**
    – Display program headers including your name aligned as specified using a big println ( ) rather than a printf ( )
    – See the page 4 screenshot

17. **Footer Output/Totals:**
    – Display program footers aligned as specified using both println ( ) and printf ( ) statements as appropriate
    – Initialise, accumulate and output formatted room carpeting cost totals
    – Remember and output details of both the largest and smallest room carpet costs
    – See the page 4 screenshot

18. Enhance the program to accept and handle both upper and lower case character input for the carpet grade and grippers using at least one logical OR operator

19. **Save – The End:**
    When finished Save and Exit TextPad

    – Zip (R/click: Send ➔ Compressed Zip) your **LastNameFirstNameLabEx1** folder
    – Upload your **LastNameFirstNameLabEx1** zip file to the Moodle link provided
    – To be **verified** by your supervisor **before** you **submit** the zip file
    – Sign the **attendance sheet** before you exit the lab

```
C:\Windows\system32\cmd.exe

Number of rooms carpeted?: 4

Gerry        Room Carpet Offcut  U-lay Gripper Gross  Disc    Net    Vat    Room
Agnew Lex 1       Cost   Cost    Cost   Cost   Cost   Cost   Cost   Cost   Cost
====================================================================================

Le/Wi/Gra/Of/Un/Gri:
3.0 3.0 A 0 0 Y
           1  90.00    0.00    0.00  15.00 155.00   9.30 145.70  29.14 174.84

Le/Wi/Gra/Of/Un/Gri:
4.0 2.0 B 1 1 N
           2  40.00    3.50   20.00   0.00  63.50   3.81  59.69  11.94  71.63

Le/Wi/Gra/Of/Un/Gri:
2.5 2.5 C 2 2 Y
           3  15.63    7.00   31.25  12.50  66.38   3.98  62.39  12.48  74.87

Le/Wi/Gra/Of/Un/Gri:
7.0 3.3 D 0 1 N
           4  23.10    0.00   57.75   0.00  80.85   4.85  76.00  15.20  91.20
====================================================================================
      Totals: 168.73   10.50 109.00   27.50 365.73  21.94 343.78  68.76 412.54
====================================================================================

Room  3 has  the  lowest carpet cost of:   15.63
Room  1 has  the highest carpet cost of:   90.00
```