SdPd/java Lab Exam 1

Objective: Connacht Tyre Fit Quotations

Connacht Tyre Fit costs are based on the grade and quantity of tyres bought, the wheels balanced and tracked, less discount and vouchers, plus Vat as shown in the below table.

Tyre Grade: A, B, C or D **A** **B** **C** **D**	**Cost / Tyre:** € 150.00 € 100.00 € 75.00 € 49.99
Quantity: min 0/max 10	
Wheels Balanced: min 0/max 10	**Cost / Wheel** € 5.00
Wheels Tracked: **Y**(es)/**N**(o)	**Tracked Cost:** € 35.00
Discount: 0, 1, 2, B, or V discount codes **0** None **1** Loyalty **1** **2** Loyalty **2** **B** Business **V** **V**alue 3% per €200 spent excluding first €100 (max 9%)	**Discount Rate** 0 **%** 2.5 % 5 % 10 % 0 to 9 %
Voucher: deducted from the gross cost 0.00 or 99.99 (zero or non-zero)	**Voucher Value:** € 99.99
Specials: instead of the normal tyre grade **P**(uncture) **T(**racking)/Balance/Rotate wheels **F(**our) C-rated tyres, balanced with tracking	**Fixed Costs** (inc VAT) € 7.50 € 50.00 € 299.99
VAT/Tax Rate Vat is charged on all transactions **except** Special deals	20.00 %

Sample Line Input & Line Input Explained:

Grade	Quantity	Balanced	Tracked	Discount	Voucher
(char)	(int)	(int)	(char)	(char)	(double)
E.g. A	4	4	Y	V	99.99

- Gr/ade – the tyre grade (char) – either **A**, **B**, **C** or **D** (or specials **P, T** or **F**)
- Quantity – the number of tyres purchased (int) – may be 0
- Bal/anced – the number of wheels balanced (int) – may be 0
- Tr/acking – wheels tracked or not (char) – **Y**(es) or **N**(o)
- Dis/count – Discount code applicable (char) – either **0, 1, 2, B** or **V**
- Voucher – Voucher deductible (double) – may be 0.00

Design a java program for Connacht Tyre Fit to calculate tyre fitting costs.

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 **LastNameFirstName2014LabEx1** folder & java file as per your own name
   – E.g. **AgnewGerry2014LabEx1** folder and **AgnewGerry2014LabEx1**.java program file
   – To be **verified** by your lab supervisor
   – Remember to rename the starter **class name** as per your java program file name

2. Add your **Program Id, Name** & **Program Description** as comments at the top of the program

3. **10%** of the Lab Exam marks are for the Algorithm sheet (enter your name at the top of the first page) which must be submitted at the end of the lab exam

4. **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, otherwise severe penalties will be incurred

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

6. **Variables:**
   Declare any necessary variables as appropriate with meaningful names and types

7. **Initialise:**
   Initialise any necessary variables such as counters and totals (not all the variables)

8. **Preliminary Input**: – see screenshot 1 on page 4
   Allow the user to enter the number of tyre jobs to be processed, via the keyboard, which can vary from day to day

9. **Multi Item Line Input:** (inside the **for** loop) – see screenshot 1 on page 4
   – Allow the user to enter tyre details, via the keyboard, on the same input line
   – Refer to the Sample Line Input and Line Input Explained on page 1

10. **Calculations:** – see the table on page 1
    Calculate the cost of each job based on the tyre grade, the number of tyres purchased, wheels balanced (if any), wheels tracked (if any), less the discount and vouchers (if any) plus VAT:

    – Calculate the Tyre cost according to the tyre grade times the tyre quantity purchased
    – Calculate the Balanced cost according to the wheel balance charge times the number of wheels balanced
    – Append the fixed Tracked cost if applicable
    – Calculate the Gross cost by summing the: Tyre cost, Balanced cost and Tracked cost
    – Calculate the Discount cost based on the Gross cost according to the Discount code provided if not 0
    – Calculate the Net cost based on the Gross cost less Discount cost and Voucher value
    – Calculate the Value Added Tax (VAT) using the VAT rate provided
    – Calculate the Final Tyre cost based on the Net cost plus VAT cost

11. **Selection: –** Tyre grade cost (using an **if/else/if**):
    Calculate the Tyre grade cost based on the tyre grade entered (A, B, C or D)

12. **Selection: –** Wheels Tracked cost (**if/else)**:
    Calculate the Wheels Tracked cost according to the Y(es)/N(o) prompt entered and the associated fixed charge where applicable otherwise 0

13. **Selection: –** Discount (**if/else/if** with nested **if/else/if)**:
    – Determine the Discount rate based on the discount code entered (0, 1, 2, B or V)
    – Then calculate the Discount cost based on the Gross cost according to the Discount rate

14. **Line Output: –** see screenshot 1 on page 4
    – Output the job number & tyre costs as shown initially unformatted with a println ( ) statement and then formatted with a printf ( ) statement for each job completed
    – Both unformatted and formatted versions required
    – Comment out the unformatted version when you get the formatted one working

15. **Header Output: –** see screenshot 1 on page 4
    – Display the program headers including your name aligned as specified
    – Using a big println ( ) rather than a printf ( ) statement

16. **Footer Output/Totals:** – see screenshot 1 on page 4
    – Display program footers aligned as specified using both println ( ) and printf ( ) statements
    – Initialise, accumulate and output formatted tyre cost totals as specified

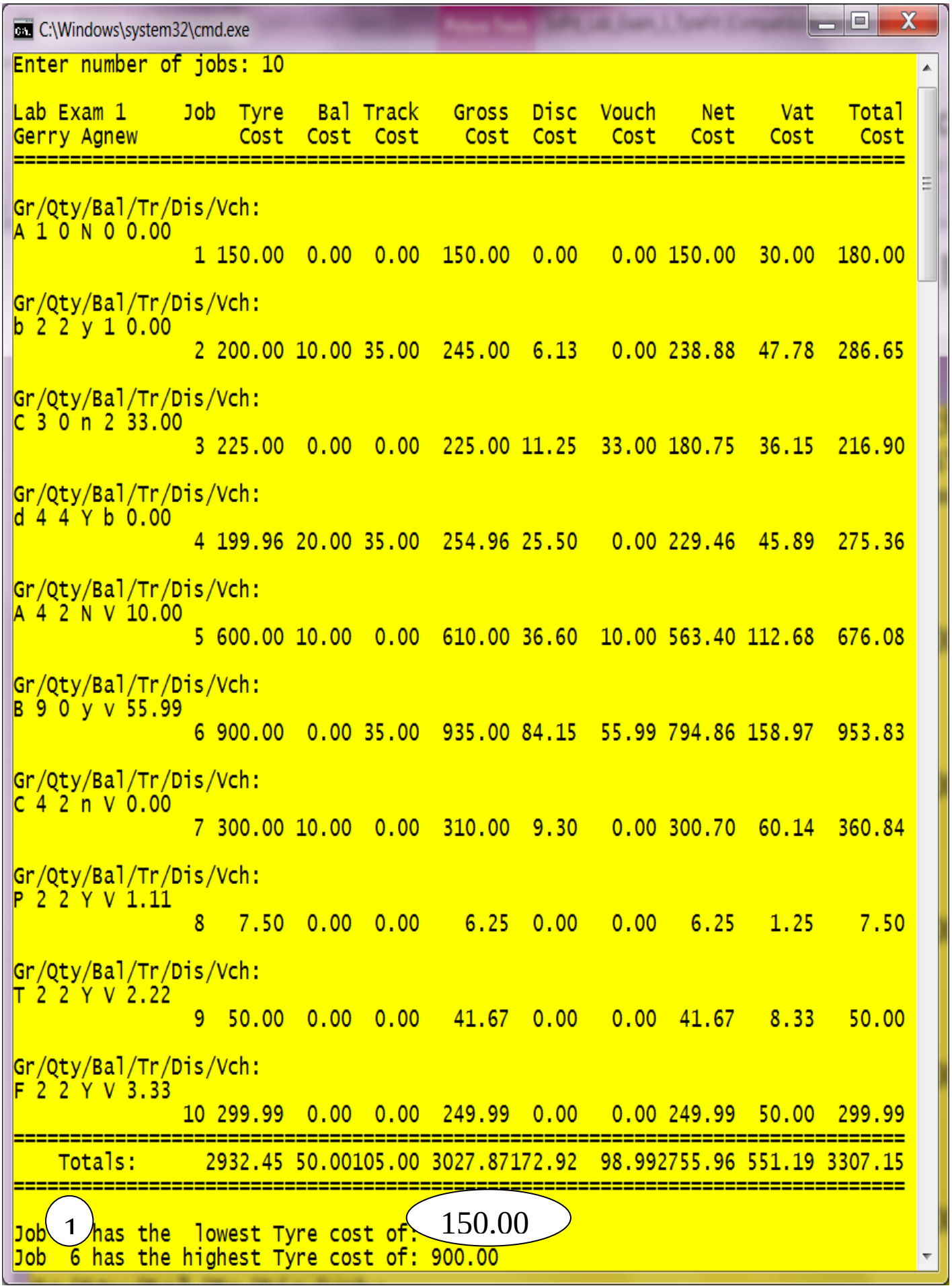
17. **Special Deals P, T & F:** – see screenshot 1 on page 4
    – Valid input must be submit for each special deal but is subsequently ignored
      i.e. no discount available on special deals
    – VAT is charged on all transactions **except** the Special deals which are inclusive of VAT
      i.e. VAT needs to be subtracted from the Gross cost and re-added to give the Total cost

18. **Largest and Smallest:** – see screenshot 1 on page 4
    – Determine, remember and output details of both the largest & smallest tyres purchased costs
    – Largest and smallest is only applicable for normal (A, B, C, D) tyre purchases excluding any of the Special tyre deals (P, T or F)

19. **Case Insensitive Character Processing:**
    – Enhance the program to accept and handle both upper and lower case character input
    – Specifically for the tyre Grade, Tracked and Discount options using logical **OR** operators

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

    – 7-Zip (R/click: Send ➔ Compressed Zip) your **LastNameFirstName2014LabEx1** folder
    – Upload your **LastNameFirstName2014LabEx1** zip file to the Moodle link provided
    – To be **verified** by your supervisor **before** you **submit** the zip file
    – Submit your Named Algorithm sheet before you exit the lab
    – Sign the **attendance sheet** before you exit the lab



C:\Windows\system32\cmd.exe

```
Enter number of jobs: 10

Lab Exam 1     Job  Tyre   Bal Track   Gross  Disc  Vouch    Net    Vat   Total
Gerry Agnew         Cost  Cost  Cost    Cost  Cost   Cost   Cost   Cost    Cost
================================================================================

Gr/Qty/Bal/Tr/Dis/Vch:
A 1 0 N 0 0.00
                 1 150.00  0.00  0.00  150.00  0.00   0.00 150.00  30.00  180.00

Gr/Qty/Bal/Tr/Dis/Vch:
b 2 2 y 1 0.00
                 2 200.00 10.00 35.00  245.00  6.13   0.00 238.88  47.78  286.65

Gr/Qty/Bal/Tr/Dis/Vch:
C 3 0 n 2 33.00
                 3 225.00  0.00  0.00  225.00 11.25  33.00 180.75  36.15  216.90

Gr/Qty/Bal/Tr/Dis/Vch:
d 4 4 Y b 0.00
                 4 199.96 20.00 35.00  254.96 25.50   0.00 229.46  45.89  275.36

Gr/Qty/Bal/Tr/Dis/Vch:
A 4 2 N V 10.00
                 5 600.00 10.00  0.00  610.00 36.60  10.00 563.40 112.68  676.08

Gr/Qty/Bal/Tr/Dis/Vch:
B 9 0 y v 55.99
                 6 900.00  0.00 35.00  935.00 84.15  55.99 794.86 158.97  953.83

Gr/Qty/Bal/Tr/Dis/Vch:
C 4 2 n V 0.00
                 7 300.00 10.00  0.00  310.00  9.30   0.00 300.70  60.14  360.84

Gr/Qty/Bal/Tr/Dis/Vch:
P 2 2 Y V 1.11
                 8   7.50  0.00  0.00    6.25  0.00   0.00   6.25   1.25    7.50

Gr/Qty/Bal/Tr/Dis/Vch:
T 2 2 Y V 2.22
                 9  50.00  0.00  0.00   41.67  0.00   0.00  41.67   8.33   50.00

Gr/Qty/Bal/Tr/Dis/Vch:
F 2 2 Y V 3.33
                10 299.99  0.00  0.00  249.99  0.00   0.00 249.99  50.00  299.99
================================================================================
    Totals:      2932.45 50.00105.00 3027.87172.92  98.992755.96 551.19 3307.15
================================================================================

Job  1 has the  lowest Tyre cost of: 150.00
Job  6 has the highest Tyre cost of: 900.00
```