**Description**

Create a new program called “**A2-ItemList**”.

This program will read records from a data file named “**A2.dat**”; perform calculations and formatting based on the values of fields in the data records and write a formatted report output to a file named “**A2-ItemList.out**”.

The format of the input and output files are provided in this document.

To help in your development efforts, you should consider writing the program in the following stages.

1. Write the program to output the Item Number, Product Class, Description, Quantity, Price per Unit for each input record to prove that you are reading the input data file properly. This ensures you are able to read the input data correctly and output the data accurately with the headings properly aligned over the data with blank lines providing required spacing.
2. Add the simple calculations for Extended Price and Net Price to complete the detail line for each record. Output this data to confirm you have done these calculations correctly.

**Note**: Use zero for the Discount Amount at this stage.

1. Determine the discount percentage or discount amount to use and add the calculation for Discount Amount. Adjust the Net Price calculation to use the Discount Amount and add the Discount Amount to the output to confirm you have done these calculations correctly.
2. Determine the transportation charge percentage or transportation charge amount to use and add the calculation for Transportation Charge. Output this data to confirm you have done these calculations correctly.
3. Add variables for the totals for Extended Price, Net Price, and Transportation Charge. Be sure to initialize these to zero.  
   After each input record is output add the detail amounts for Extended Price, Net Price, and Transportation Charge to their respective totals.  
   Output the totals for Extended Price, Net Price, and Transportation Charge properly aligned with the detail columns as shown to confirm you have done these calculations correctly.
4. Add variables for the count of the number of items, the number of items with a discount and the percentage of items without a discount. Be sure to initialize these variables to zero.  
   After all the input records are output then calculate the percentage of items without a discount.  
   Output the percentage of items without a discount to confirm you have done these calculations correctly.

**Input File**

Download the required data file (**A2.dat**) from DC Connect.

Each data record is **27** characters long with the following format (pay close attention to the price per unit, since the decimal is not stored in the data file).

The following is intended to provide the column layout of the file:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Columns | 1-4 | 5 | 6-18 | 19-21 | 22-27 |
| Field Name | Item Number | Product Class | Description | Qty | Price Per Unit |
| Example data | 2047  1742 | B  A | Typewriter  Handle | 105  10 | 800.00  10.00 |

**Specification**

For this assignment you:

* **MUST** use the appropriate arithmetic verbs (ADD, MULTIPLY, etc.)
* **MUST NOT** use the COMPUTE verb.

1. **General Formatting**:

Print out the detail line for each item **double spaced** (see sample):

* 1. The headings and data must be output according to the sample format provided with everything aligned correctly in columns.
  2. The column titles (data field names) are Item Number, Item Description, Quantity, Per Unit Price, Extended Price (Quantity \* Per Unit Price), Discount Amount, Net Price, Product Class, Transportation % (print in percent form, e.g. 11.5%),and Transportation Charge.
  3. OUTPUT NUMERIC EDITING for the detail line.

Use Z, 9 and ‘,’ (comma). Leave 1 digit to the left of the decimal point (i.e. 0.09) for small values.

1. **Discount Calculations**:

A discount of 5% is allowed for:

1. Product Class A - only if the Extended Price is greater than $100
2. Product Class F - only if the Extended Price is greater than $50
3. Product Class B - only if the Quantity is greater than 5

For Product Classes without a discount the DISCOUNT AMOUNT field is to be printed as 0.00.

1. **Transportation Charge Calculations**:
2. For Product Class A - it is 12.5% of the Extended Price.
3. For Product Class D - it is 8.5% of the Extended Price.
4. For Product Class F - it is 4.5% of the Extended Price.
5. For all other classes, if the quantity is 100 or less, the Transportation Charge is 6.5% of the Extended Price, otherwise it's a flat $45.00.
6. For the flat Transportation Charge print the transportation % as 0.0%. In all cases, **DO NOT** add the transportation charge to the net price.
7. **Report Headings:**
8. Print your name & A2 at the top as shown on the sample output. Use 01 in Working-Storage for these headings.
9. Print the column headings shown on the attached.  
   Use 01 in working-storage for this heading.
10. **Leave 2 blank lines before and after the column heading lines.**
11. **Summary Line:**

Accumulate and print (WITHOUT TITLES) aligned correctly under their respective columns,

* 1. the totals of
     1. the extended prices,
     2. net prices and
     3. transportation charges.
  2. Use floating $ and ‘,’ (comma) editing.
  3. **Leave 2 blank lines between the last data line and this line.**
  4. Use 01 in working-storage for this total line.

1. **Overall Discount Analysis:**
2. Calculate the percentage of items that did not received a discount, correct to 1 decimal place.
3. Print the result on a separate line (after #5)  
   with the label “**ITEMS WITHOUT DISCOUNT** **=** ”
4. Use 01 level in working-storage for this total line.

**Submission Requirements**

**Turn in a zip or 7z archive containing the Visual Studio (VS) project and solution files to the drop box in your DC Connect Lab Section**

**Marking**

**25** marks for following the programming standards document

**2** marks for report heading stored in working-storage and output on first page only

**2** marks for each page heading stored in working-storage and output on each page

**10** marks for column headings aligned over detail line columns

**10** marks for columns in detail line having correct output format and valid data

**10** marks for correct rounded calculations of calculated fields in detail line (Extended Price, Discount Amount, Net Price, Trans %, Trans Charge)

**6** marks for blank line before and after report heading, two blank lines after page headings, blank line after each detail line, two blank lines after total line

**4** marks for three correct totals, and one correct summary percentage

**2** marks for complete VS project submission in zip or 7z file  
**2** marks for correct program name

**2** marks for correct output file name

**Total 75 marks**

**Sample Output Layout** (Note: sample data may not match data file provided)

YOUR NAME HERE, A2

----+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8----+----9----+----0----+---

ITEM ITEM QTY UNIT EXTENDED DISCOUNT NET PRICE CLASS TRANS TRANSPORTATION

# DESCRIPTION PRICE PRICE AMOUNT % CHARGE

1111 1ST PLACE MDL 111 0.01 1.11 0.00 1.11 A 29.0 0.10

2047 TYPEWRITER 105 801.00 84,000.00 4,200.00 79,800.00 B 14.0 6,300.00

1742 HANDLE 20 10.00 100.00 0.00 100.00 A 29.0 9.00

2149 USB DRIVE 150 2,000.00 180,000.00 0.00 180,000.00 C 0.0 45.00

3761 TAPE 5 5,000.00 25,000.00 0.00 25,000.00 D 11.5 2,625.00

2791 BOLTS 200 0.75 7.50 0.00 7.50 A 29.0 0.68

\*\*\*\*\*\*\* more detail lines removed from here \*\*\*

0001 LOW BALL 1 0.01 0.01 0.00 0.01 G 11.5 0.00

9999 LAST RECORD 999 0.01 9.99 0.00 9.99 A 29.0 0.90

$99,999,999.99 $99,999,999.99 $99,999,999.99

ITEMS WITHOUT DISCOUNT = 9.9%