SdPd/java Lab Exam 2

Objective: Connacht Water Utility Usage and Costs

Connacht Water maintains water usage and cost data using a sequential text file*.*

1. **Download** the lab exam 2 **zip** file and extract the folder, **Saved** on the desktop (**No USBs)**
   – Rename the **LastNameFirstNameLabEx2** folder and java file as per your own name
   – E.g. **AgnewGerryLabEx2** folder and **AgnewGerryLabEx2**.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

5. **Input File layout:** each record consists of the following details about each water customer:
   – Customer Id (int) – e.g. 1234
   – Customer Status (char) – a/Active, s/Suspended, x/X inactive – e.g. A
   – Customer First Name (String – max 10) – e.g. Gerry
   – Customer Last Name (String – max 10) – e.g. Agnew
   – Customer Plan (char) – either 1, 2, C, F or B – e.g. f/F
   – Customer Standing Charge (double) – e.g. 99.99
   – Customer Free Units (int) – e.g. 200
   – Customer Usage (int) – 4 quarterly unit usage values – e.g. 100, 110, 120, 130

6. **Input File Contents:** – see Screenshot 1 on page 3
   – Locate the input text file “WaterUsage.dat” contained in your renamed Lab Exam 2 folder
   – Verify the input text file contents using Note Pad (or equivalent)

7. **Constants / Variables:**
   Declare constants & variables (inc. file objects) as appropriate with meaningful names & types
   – Ensuring that the file layout is highlighted and not mixed with other ordinary variables

8. **Initialise:**
   Initialise any necessary variables especially counts and totals (but not all the variables)

9. **Main Processing / File Input:**
   – Using an EOF controlled **while** loop read each customer from the file until there are no more records left to be processed
   – Read each field in the order defined by the record layout using an appropriate method according to the field type
   – Using an inner **for** loop read the 4 quarterly water usage unit values for each customer

10. **Header Output:** – see Screenshot 2 on page 3
    Display the program headers including **your name** aligned as specified using println ( ) rather

than printf ( ) statements

11. **Line Output:** – see Screenshot 2 on page 3
    Display formatted customer details only for **active** customers:
    – Customer Id, Name, Plan, Stand Charge, Free Units, Quarterly Units (*4), Sum Units, Average and Cost
    – Name is displayed with Last Name preceding First Name separated with a comma concatenated into a single column
    – Customers with a s/S(uspended) or x/X Inactive status are not processed/displayed
    – The Customer Plan character is mapped to the Plan name using a **switch** statement with default "Pending" if an invalid Plan code is encountered
      E.g. 1/Single, 2/Double, c/Concession, f/Family, b/Big Family otherwise Pending
    – The Annual Average is calculated by summing the 4 quarterly units and then dividing by 12
    – The Water cost is calculated as Annual units less free units, times the Unit cost plus Standing charge (which cannot be less than the standing charge)
    – Otherwise, display unformatted customer details if unable to format the output

12. **Footer Output:** – see Screenshot 2 on page 3
    After all the data has been processed display the following footers:

    – Total, Inactive, Suspended and Active Customer counts
    – Customer Plan counts (Single, Double, Concession, Family, Big Family, Pending)
    – Customer name who used the least quarterly water units above 0 and the associated period
    – Customer name with the most expensive water cost (including the standing charge)
    – Number of high usage customer records output to the new High Water Usage text file

13. **Output Report:** – see screenshot 3 on page 4
    Output or mirror the screen contents to a Report file called "WaterUsageReport.dat"

14. **Output High Water Usage File:** – see screenshot 4 on page 4
    – Write customer data (as indicated) using the original input file layout, plus the sum, average and cost to a new output text file called "HighWaterUage.dat"
    – Only for costs that equal or exceed the Water Cost limit entered using an Input dialog

15. **Input and Message Dialogues:** – see screenshots 5 & 6 on page 4
    – Input the Find Customer Last name and Water Cost Limit using 2 seeded **Input dialogs** at the start of the program (with Last Name = Your Last Name and Water Limit = 200.00)
    – Output the corresponding Lastname Found message summary if the Customer last name is matched, case insensitively regardless of customer status, using a **Message dialogue** with appropriate "Your Name" Title and Icon
    – Otherwise, show an appropriate warning if the Customer last name entered is not found

16. **Close Files:**
    Close the file objects, especially any newly created Output files to ensure they are saved permanently, otherwise they might appear empty

17. **Save – The End:**
    – When finished Save and Exit TextPad
    – 7 Zip (R/click: Zip format – **not RAR or 7 Zip**) your **LastNameFirstNameLabEx2** folder
    – Upload your **LastNameFirstNameLabEx2** 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
    – Submit the named **Algorithm** sheet before you exit the lab

Water Usage Input Text File – Screenshot 1

WaterUsage - Notepad

File Edit Format View Help

```
1001 A Gerry      Agnew      1  50.00  100   10   10   10   10
1002 A Mary       Murphy     2  30.00  200   10   20   30   40
1003 A Paddy      Reilly     Z  10.00  150   25    0    8    0
1004 A Sam        Agnew      F   9.99  100  104  102  103  101
1005 A Sue        Agnew      b  99.99  100  400  100  200  300
1006 x aaa        aaa        f  29.99    1    1    1    1    1
1007 s bbb        bbb        f  15.00    1    1    1    1    1
1008 x Mary       aGnEw      f  40.00    1    1    1    1    1
1009 s Pat        agneW      f  50.00    1    1    1    1    1
1010 s Ollie      Orangey    f   0.00    1    1    1    1    1
1011 A Rita       Redy       1   0.99  500 1000  500  500 1000
1012 A Barry      Bluey      2   9.99  500 1200 1300 1000 1100
1013 A Gary       Grey       c  99.99  500  520  510  540  530
1014 A Brian      Browney    z  10.00 1000 2001 2001 1999 1999
1015 A Witney     Whitey     F  50.00  300  304  302  300  301
```

Screen Output – Screenshot 2

C:\Windows\system32\cmd.exe

```
Gerry Agnew - Lab Exam 2 (December 2014)

  Id     Name          Plan  Stand  Free   Q1   Q2   Q3   Q4   Sum  Avg    Cost
=============================================================================
1001 Agnew,Gerry     Single  50.00   100   10   10   10   10    40    3   50.00
1002 Murphy,Mary     Double  30.00   200   10   20   30   40   100    8   30.00
1003 Reilly,Paddy   Pending  10.00   150   25    0    8    0    33    3   10.00
1004 Agnew,Sam       Family   9.99   100  104  102  103  101   410   34   40.99
1005 Agnew,Sue      Big Fam  99.99   100  400  100  200  300  1000   83  189.99
1011 Redy,Rita       Single   0.99   500 1000  500  500 1000  3000  250  250.99
1012 Bluey,Barry     Double   9.99   500 1200 1300 1000 1100  4600  383  419.99
1013 Grey,Gary      Concess  99.99   500  520  510  540  530  2100  175  259.99
1014 Browney,Brian  Pending  10.00  1000 2001 2001 1999 1999  8000  667  710.00
1015 Whitey,Witney   Family  50.00   300  304  302  300  301  1207  101  140.70

    Customers:  15     Inactive:   2    Suspended:   3       Active:  10
       Single:   2       Double:   2   Concession:   1
       Family:   2   Big Family:   1      Pending:   2

Least units: 8 used in quarter: 3 by: Paddy Reilly

Most expensive Water cost: 710.00 used by: Brian Browney

4 High Usage Water Cost records >= 200.00 Output
```

Screen Output/Mirrored Report File – Screenshot 3

WaterUsageReport - Notepad

File Edit Format View Help

```
Gerry Agnew - Lab Exam 2 (December 2014)

  Id     Name          Plan   Stand  Free   Q1    Q2    Q3    Q4    Sum  Avg    Cost
=============================================================================================
1001 Agnew,Gerry     Single  50.00   100   10    10    10    10     40    3   50.00
1002 Murphy,Mary     Double  30.00   200   10    20    30    40    100    8   30.00
1003 Reilly,Paddy   Pending  10.00   150   25     0     8     0     33    3   10.00
1004 Agnew,Sam       Family   9.99   100  104   102   103   101    410   34   40.99
1005 Agnew,Sue      Big Fam  99.99   100  400   100   200   300   1000   83  189.99
1011 Redy,Rita       Single   0.99   500 1000   500   500  1000   3000  250  250.99
1012 Bluey,Barry     Double   9.99   500 1200  1300  1000  1100   4600  383  419.99
1013 Grey,Gary      Concess  99.99   500  520   510   540   530   2100  175  259.99
1014 Browney,Brian  Pending  10.00  1000 2001  2001  1999  1999   8000  667  710.00
1015 Whitey,Witney   Family  50.00   300  304   302   300   301   1207  101  140.70

    Customers:  15     Inactive:   2    Suspended:   3       Active:  10
       Single:   2       Double:   2   Concession:   1
       Family:   2   Big Family:   1      Pending:   2

Least units: 8 used in quarter: 3 by: Paddy Reilly

Most expensive Water cost: 710.00 used by: Brian Browney
```

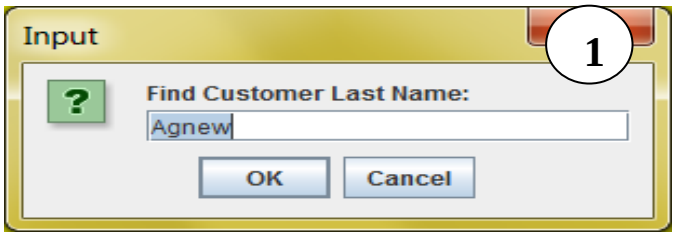
New High Water Usage Output File – Screenshot 4

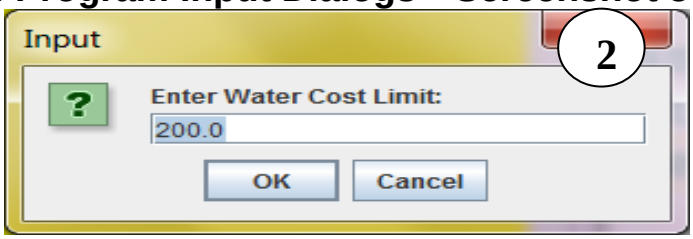
HighWaterUsage - Notepad

File Edit Format View Help

```
1011 A Rita      Redy      1   0.99   500  1000  500  500 1000  3000  250  250.99
1012 A Barry     Bluey     2   9.99   500  1200 1300 1000 1100  4600  383  419.99
1013 A Gary      Grey      c  99.99   500   520  510  540  530  2100  175  259.99
1014 A Brian     Browney   z  10.00  1000  2001 2001 1999 1999  8000  667  710.00
```

Start of Program Input Dialogs – Screenshot 5





End of Program Output Dialog – Screenshot 6