SdPd/java Lab Exam 2

Objective: Connacht Adventure Race Times and Equipment Costs
Connacht Adventure maintains race times and equipment hire data using a sequential text file*.*

1. **Download** the lab exam 2 **zip** file and extract the folder, **Saved** in the root U: Drive (**No USBs)**
   – Rename the **LastNameFirstName16LabEx2** folder and java file as per your own name
   – E.g. **AgnewGerry16LabEx2** folder and **AgnewGerry16LabEx2**.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 race competitor:
   – Competitor Id (int)   – e.g. 101
   – Club Code (char) – either G, E, W, S or N   – e.g. g/G
   – Competitor First Name (String – max 10)   – e.g. Gerry
   – Competitor Last Name (String – max 10)   – e.g. Agnew
   – Competitor Race Type (char) – either M, S or F   – e.g. m/M
   – Early Bird Discount on equipment hire (char) – y or n   – e.g. y/Y
   – Competitor Race Times (double) – 4 race values   – e.g. 95.5, 98.6, 97.4, 98.1

6. **Input File Contents:** – see Screenshot 1 on page 3
   – Locate the input text file "RaceDetails.dat" contained in your renamed Lab Exam 2 folder
   – Verify the input text file contents and number of columns 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 competitor's details 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 race times for each competitor

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

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11. **Line Output:** – see Screenshot 2 on page 3
    Display formatted competitor details only for competitors with a valid club code:
    – Competitor Id, Name, Club Name, Race Type, Early Bird Discount, Race times (*4),
      Average race time and Equipment Cost
    – Name is concatenated and displayed in a single column as per the screenshot
    – Competitors with an n/N (Not Competing) for club code are not processed/displayed
    – The Competitor Club code character is mapped to the Club name using a **switch** statement
      with default "Not Competing" if an invalid club code is encountered
      E.g. g/Galway, e/Ennis, w/Westport, s/Sligo otherwise Not Competing
    – The Competitor race type character is mapped to the race type name using an **if/else/if**
      statement with default "Invalid type" if an invalid race type code is encountered
      E.g. m/Mini, s/Sport, f/Full otherwise Invalid type
    – Race Type Equipment Costs are as follows: M/€20.00, S/€25.00 and F/€30.00
    – Calculate Average race time (double) by summing the 4 race times and then dividing by 4.0
    – The Equipment cost is calculated as the race type equipment cost multiplied by the 4 races
      and less any early bird discount (10%)
    – Otherwise, display unformatted competitor 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:

    – Competing, Not-Competing, Club Name Counts (Galway, Ennis, Westport, Sligo)
    – Race Type counts (Mini, Sport, Full)
    – Competitor name who was the first over the line including the race type and their time
    – Competitor name who was the last over the line including the race type and their time
    – Number of competitors in the Mini race whose average is under a certain time as entered
      using an Input dialog

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

14. **Output Non-Competing Report: -** see screenshot 4 on page 4
    – Write competitor details (as indicated) who are not competing and therefore have an "N"
      for the club name out to a new output report file called "NonCompetingRep.dat"

15. **Output Early Bird Discount Competitors File:** – see screenshot 5 on page 4
    – Write competitors who received an early bird discount (as indicated) using the ID, full name,
      club name and race type, to a new output text file called "EarlyBird.dat"

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. **Input and Message Dialogues:** – see screenshots 6 & 7 on page 4
    – Input the Find Club Name and Race time Limit using 2 seeded **Input dialogs** at
      the start of the program (with Club Name = Galway and Race time Limit = 75.00)
    – Output the corresponding Club Name Found message summary if the Club name is
      matched, case insensitively, using a **Message dialogue** with appropriate "Club Name",
      Title and Icon otherwise, show an appropriate warning if the Club name entered is not found

18. **Save – The End:**
    – When finished Save and Exit TextPad
    – Zip (R/click: Zip format – **not RAR or 7 Zip**) your **LastNameFirstName16LabEx2** folder
    – Upload your **LastNameFirstName16LabEx2** zip file to the Moodle link provided

RaceDetails - Notepad

File   Edit   Format   View   Help

```
101   g Gerry      Agnew      S   Y    95.5    98.6    97.4    98.1
102   E Jim        White      s   y   101.5   108.6   102.4   106.5
103   G Joe        Lee        M   n    67.2    78.6    67.9    72.1
104   n Henry      Adams      s   y    95.5    98.6    97.4    98.1
105   e Sam        Brown      F   n   142.3   148.2   150.1   146.5
106   N Gerry      Lyons      m   y    72.6    76.9    80.4    73.5
107   S Liam       Malley     M   N    70.2    75.5    78.3    74.1
108   G Gerry      Lyons      M   y    72.6   |76.9    80.4    73.5
109   w Andy       Ryan       F   y   132.5   136.8   140.8   141.2
110   E John       Giles      F   Y   141.1   151.6   155.3   145.9
111   N Harry      King       M   y    73.6    76.1    81.9    73.5
112   w Tim        Hayes      F   n   155.3   159.6   161.8   158.4
113   S Eric       Green      m   y    72.6    76.9    80.4    73.5
```

Screen Output – Screenshot 2

```
Gerry Agnew - Lab Exam 2 (December 2016)

ID  Competitor     Club     Type  EB   R1      R2      R3      R4       Avg   Cost
=================================================================================
101 Gerry Agnew    Galway   Sport Y    95.5    98.6    97.4    98.1     97.4  90.00
102 Jim White      Ennis    Sport y   101.5   108.6   102.4   106.5   104.8  90.00
103 Joe Lee        Galway   Mini  n    67.2    78.6    67.9    72.1     71.5  80.00
105 Sam Brown      Ennis    Full  n   142.3   148.2   150.1   146.5   146.8 120.00
107 Liam Malley    Sligo    Mini  N    70.2    75.5    78.3    74.1     74.5  80.00
108 Gerry Lyons    Galway   Mini  y    72.6    76.9    80.4    73.5     75.9  72.00
109 Andy Ryan      Westport Full  y   132.5   136.8   140.8   141.2   137.8 108.00
110 John Giles     Ennis    Full  Y   141.1   151.6   155.3   145.9   148.5 108.00
112 Tim Hayes      Westport Full  n   155.3   159.6   161.8   158.4   158.8 120.00
113 Eric Green     Sligo    Mini  y    72.6    76.9    80.4    73.5     75.9  72.00

Competitor Counts:

Competing:  10    Not Competing:   3
Clubs:  Galway: 3   Ennis: 3   Westport: 2   Sligo: 2
Mini Race: 4   Sport Race: 2   Full Race: 4

The first competitor over the line was Lee, Joe in the Mini race in 67.2 minutes.
The last competitor over the line was Hayes, Tim in the Full race in 161.8 minutes.

2 competitors had an overall average in the Mini race of less than 75 minutes.
```

Screen Output/Mirrored Report File – Screenshot 3

```
RaceDetailsRep - Notepad

File  Edit  Format  View  Help

Gerry Agnew - Lab Exam 2 (December 2016)
  ID   Competitor   Club      Type  EB    R1      R2      R3      R4        Avg    Cost
========================================================================================
 101 Gerry Agnew   Galway    Sport  Y    95.5    98.6    97.4    98.1      97.4   90.00
 102 Jim white     Ennis     Sport  y   101.5   108.6   102.4   106.5     104.8   90.00
 103 Joe Lee       Galway    Mini   n    67.2    78.6    67.9    72.1      71.5   80.00
 105 Sam Brown     Ennis     Full   n   142.3   148.2   150.1   146.5     146.8  120.00
 107 Liam Malley   Sligo     Mini   N    70.2    75.5    78.3    74.1      74.5   80.00
 108 Gerry Lyons   Galway    Mini   y    72.6    76.9    80.4    73.5      75.9   72.00
 109 Andy Ryan     westport  Full   y   132.5   136.8   140.8   141.2     137.8  108.00
 110 John Giles    Ennis     Full   Y   141.1   151.6   155.3   145.9     148.5  108.00
 112 Tim Hayes     Westport  Full   n   155.3   159.6   161.8   158.4     158.8  120.00
 113 Eric Green    Sligo     Mini   y    72.6    76.9    80.4    73.5      75.9   72.00

Competitor Counts:

Competing: 10     Not Competing:    3
Clubs:  Galway:  3    Ennis: 3    Westport: 2    Sligo: 2
Mini Race: 4    Sport Race: 2    Full Race: 4

The first competitor over the line was Lee, Joe in the Mini race in 67.2 minutes.
The last competitor over the line was Hayes, Tim in the Full race in 161.8 minutes.

2 competitors had an overall average in the Mini race of less than 75 minutes.
```
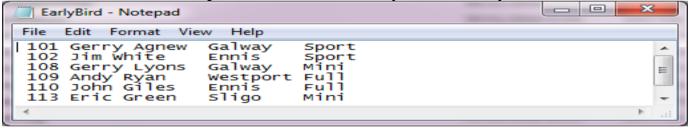
Non Competing Report File – Screenshot 4

```
NonCompetingRep - Notepad

File  Edit  Format  View  Help

 104 Henry Adams   n  s  y  - Non Competing
 106 Gerry Lyons   N  m  y  - Non Competing
 111 Harry King    N  M  y  - Non Competing
```

Early Bird Discount Competitors Output File – Screenshot 5

```
EarlyBird - Notepad

File  Edit  Format  View  Help

 101  Gerry  Agnew     Galway      Sport
 102  Jim  white       Ennis       Sport
 108  Gerry  Lyons     Galway      Mini
 109  Andy  Ryan       westport    Full
 110  John  Giles      Ennis       Full
 113  Eric  Green      Sligo       Mini
```

Start of Program Input Dialogs – Screenshot 6

```
Input                                     1
 ?   Find Club Name:
     Galway
          OK      Cancel
```

```
Input                                     
 ?   Enter Average Race Time Limit for Mini race:
     75.0
          OK      Cancel                   2
```

End of Program Output Dialog – Screenshot 7

```
Club Name Found - Galway                  3
 (i)    101   Gerry Agnew    Sport
        103   Joe Lee        Mini
        108   Gerry Lyons    Mini
               OK
```

```
Club Name Not Found                       4
 /!\   Sorry Club Name: Cork not found - please try again
               OK
```