Assessment 2 - Challenge section

The challenge version main menu is as follows:

```
Please choose from the following options:
    1 - Load data from a file
    2 - Display the data to the screen
    3 - Rename a set
    4 - Sort a set
    5 - Analyse a set
    6 - Save data to a file
    7 - Compare two sets
    8 - Edit a set
    9 - Quit
```

Option 6 - Save data to a file

```
Enter the filename, including file extension (e.g. data.csv):
```

Ensure that the filename is not blank, then save the file in standard CSV format - your program should be able to successfully load any files it saves.

Option 7 - Compare two sets

Comparing two sets will display the statistical reports (like option 5) side by side. If the sets have the same length, this option should display the Pearson correlation. See the sample output below. For full marks, your program must be able to replicate the output below perfectly.

Option 8 - Edit a set

Editing a set will first ask the user which set they want to edit. The program will then enter sub-menu that will allow the user to perform multiple editing operations before returning to the main menu. There operations are: inserting a value, modifying a value, and deleting a value. See the sample otuput below.

Important note

Regardless of how users use your program, it must not crash, nor enter an infinite loop. The sample run below is not intended to be a comprehensive test of the program. You must reason for yourself about possible user inputs and how to handle them gracefully.

Sample run

```
Welcome to the Smart Statistician!
Programmed by Ada Lovelace

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>>> 1
Enter the filename: maxtemps.csv
Data has been loaded successfully.

Please choose from the following options:
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    2 – Display the data to the screen
    3 – Rename a set
    4 – Sort a set
    5 – Analyse a set
    6 - Save data to a file
    7 - Compare two sets
    8 - Edit a set
    9 - Quit
>>> 7
Which set do you want to compare first?
    1 - Max Temp in Townsville
    2 - Max Temp in Cairns
    3 - Max Temp in Brisbane
>>> 1
Which set do you want to compare second?
    1 - Max Temp in Townsville
    2 - Max Temp in Cairns
    3 - Max Temp in Brisbane
>>> 2
                     Max Temp in Townsville   Max Temp in Cairns
                     ----------------------   ------------------
number of values (n): 31                      31
             minimum: 22                      24
             maximum: 28                      28
                mean: 25.19                   26.29
              median: 25.00                   26.00
                mode: 26                      27
  standard deviation: 1.55                    1.11
Pearson correlation: r = 0.4339

Please choose from the following options:
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    3 – Rename a set
    4 – Sort a set
```

```
    5 – Analyse a set
    6 - Save data to a file
    7 - Compare two sets
    8 - Edit a set
    9 - Quit
>>> 1
Enter the filename: a.csv
Data has been loaded successfully.

Please choose from the following options:
    1 – Load data from a file
    2 – Display the data to the screen
    3 – Rename a set
    4 – Sort a set
    5 – Analyse a set
    6 - Save data to a file
    7 - Compare two sets
    8 - Edit a set
    9 - Quit
>>> 7
Which set do you want to compare first?
    1 - Rainfall
    2 - Age
    3 - Odometer Reading
>>> 1
Which set do you want to compare second?
    1 - Rainfall
    2 - Age
    3 - Odometer Reading
>>> 1
There's no point comparing a set to itself!
Which set do you want to compare second?
    1 - Rainfall
    2 - Age
    3 - Odometer Reading
>>> 2
                     Rainfall   Age
                     --------   ---
number of values (n): 10         4
             minimum: 12         14
             maximum: 111        76
                mean: 52.20      37.00
              median: 44.50      29.00
                mode: 23         none
  standard deviation: 31.35      23.72
Datasets have different size; cannot compute correlation.

Please choose from the following options:
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    6 - Save data to a file
    7 - Compare two sets
```

```
    8 - Edit a set
    9 - Quit
>>> 8
Which set do you want to edit?
    1 - Rainfall
    2 - Age
    3 - Odometer Reading
>>> 2
You are editing Age
    (i)nsert a value
    (m)odify a value
    (d)elete a value
    (f)inish editing
>>> i
You are inserting a value in Age.
Where will you insert the value?
    1. at the beginning
    2. between 35 and 23
    3. between 23 and 14
    4. between 14 and 76
    5. at the end
    6. cancel insert
>>> 2
You are inserting at location 2, between 35 and 23.
Enter the value to insert: 999
You have inserted 999.
You are editing Age
    (i)nsert a value
    (m)odify a value
    (d)elete a value
    (f)inish editing
>>> m
Which value will you modify?
    1. 35
    2. 999
    3. 23
    4. 14
    5. 76
    6. cancel modify
>>> 2
Enter the new value:
>>> 81
You have modified 999 to 81.
You are editing Age
    (i)nsert a value
    (m)odify a value
    (d)elete a value
    (f)inish editing
>>> d
Which value will you delete?
    1. 35
    2. 81
    3. 23
    4. 14
    5. 76
```

```
    6. cancel delete
>>> 1
You have deleted 35 from location 1.
You are editing Age
    (i)nsert a value
    (m)odify a value
    (d)elete a value
    (f)inish editing
>>> d
Which value will you delete?
    1. 81
    2. 23
    3. 14
    4. 76
    5. cancel delete
>>> 5
You have cancelled the delete operation.
You are editing Age
    (i)nsert a value
    (m)odify a value
    (d)elete a value
    (f)inish editing
>>> f
Please choose from the following options:
    1 – Load data from a file
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    5 – Analyse a set
    6 - Save data to a file
    7 - Compare two sets
    8 - Edit a set
    9 - Quit
>>> 9
```