Contents

1. Introduction

This program is used to calculate the nerd score and find out the nerd rating of a person. It provides a menu using which the user can provide three inputs – Fandom score, Hobbies score and Number of sports played. These three inputs are used to calculate the nerd score based on a formula and decide the nerd class to which the user belongs.

2. Task 1: A Menu

It is an interactive menu, that takes the input from the user and returns to the menu, validates each user input, and gives output accordingly.

After running the program "menu_30281229", the menu is displayed on the output screen as shown in the below figure 2.1. The menu provides 7 options to the user to choose from. In case of wrong input error appears as shown in Figure 2.2

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice :
```

Figure 2.1 : Menu

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : -1
Invalid Input, try again
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice :
```

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : 8
Input cannot be greater than 7! Re-enter!
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice :
```

Figure 2.2 : Wrong choice in menu

2.1 Fandom Score

Choose option 1 from the menu to input fandom score as shown in figure 2.3

Fandom score is the number of things that the user considers themself to be a 'fan of'.

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 1
Fandom Score is the number of things that the person considers them-self a 'fan of'.
For example, if you like both Star Wars and Star Trek but nothing else, then you have a score of 2
Enter the number of things that you are a fan of :
```

Figure 2.3 : Choosing fandom score

After choosing option 1 from the menu, input the correct value for the fandom score as shown in an example in figure 2.4. Also notice that after each input the program returns to the menu for the user to choose another option by prompting enter choice.

```
Enter choice : 1
Fandom Score is the number of things that the person considers them-self a 'fan of'.
For example, if you like both Star Wars and Star Trek but nothing else, then you have a score of 2
Enter the number of things that you are a fan of : 1
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice :
```

Figure 2.4 : Entering input for fandom score

User must enter any positive integer more than zero to avoid any error. In case of a wrong input for example a string, negative integers or zero error message appears and the program asks the user to re-enter as shown in Figure 2.5, 2.6 and 2.7

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : 1
Fandom Score is the number of things that the person considers them-self a 'fan of'.
For example,if you like both Star Wars and Star Trek but nothing else, then you have a score of 2
Enter the number of things that you are a fan of : -1
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter the number of things that you are a fan of :
```

Figure 2.5 : Entering negative input for fandom score

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : 1
Fandom Score is the number of things that the person considers them-self a 'fan of'.
For example,if you like both Star Wars and Star Trek but nothing else, then you have a score of 2
Enter the number of things that you are a fan of : One
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter the number of things that you are a fan of :
```

Figure 2.6 : Entering string input for fandom score

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : 1
Fandom Score is the number of things that the person considers them-self a 'fan of'.
For example,if you like both Star Wars and Star Trek but nothing else, then you have a score of 2
Enter the number of things that you are a fan of : 0
Invalid input, input cannot be zero, re-enter!
Enter the number of things that you are a fan of :
```

Figure 2.7 : Entering zero as input for fandom score

2.2 Hobbies Score

Choose option 2 from the menu to input hobbies score as shown in figure 2.8

The description of the expected input is printed when hobbies score is chosen.

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 2
Your Hobbies Score is the number of hobbies you undertake every week.
You are expected to enter a monthly score, assuming 4 weeks in a month, the input should be a multiple of 4
Enter the number of hobbies you undertake per month :
```

Figure 2.8 : Choosing hobbies score

After choosing option 2 from the menu, input the correct value for the hobbies score as shown in an example in figure 2.9. Also notice that after each input the program returns to the menu for the user to choose another option by prompting enter choice.

```
 ------------------------------------
Enter choice : 2
Your Hobbies Score is the number of hobbies you undertake every week.
You are expected to enter a monthly score, assuming 4 weeks in a month, the input should be a multiple of 4
Enter the number of hobbies you undertake per month : 4
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice :
```

Figure 2.9 : Entering input for hobbies score

User must enter zero or any positive integer to avoid any error. In case of a wrong input for example negative integers, string or a number which is not a multiple of 4, an error message appears and the program asks the user to re-enter as shown in Figure 2.10

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : 2
Your Hobbies Score is the number of hobbies you undertake every week.
You are expected to enter a monthly score, assuming 4 weeks in a month, the input should be a multiple of 4
Enter the number of hobbies you undertake per month : -4
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter the number of hobbies you undertake per month : Four
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter the number of hobbies you undertake per month : 2
Invalid input, input should be a multiple of 4 including zero, re-enter!
Enter the number of hobbies you undertake per month :
```

Figure 2.10 : Entering negative inputs, string for hobbies score

2.3 Number of Sports

Choose option 3 from the menu to input number of sports played as shown in figure 2.11

The description of the expected input is printed when option 3 is chosen.

```
 ----------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ----------------------------------
Enter choice : 3
A person is considered to play a sport if they own an item that could be used in that sport.
If a person owns a soccer ball then their score is 1.
If an item can be used for multiple sports, then it only counts as 1 towards this number.
Enter number of sports played :
```

Figure 2.11 : Choosing Number of Sports played

After choosing option 3 from the menu, input the correct value for the fandom score as shown in an example in figure 2.. Also notice that after each input the program returns to the menu for the user to choose another option by prompting enter choice.

```
 ------------------------------------
Enter choice : 3
A person is considered to play a sport if they own an item that could be used in that sport.
If a person owns a soccer ball then their score is 1.
If an item can be used for multiple sports, then it only counts as 1 towards this number.
Enter number of sports played : 1
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice :
```

Figure 2.11 : Entering input for number of sports played

User must enter zero or any positive integer to avoid any error. In case of a wrong input for example negative integers, string or a floating number, an error message appears and the program asks the user to re-enter as shown in Figure 2.12

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 3
A person is considered to play a sport if they own an item that could be used in that sport.
If a person owns a soccer ball then their score is 1.
If an item can be used for multiple sports, then it only counts as 1 towards this number.
Enter number of sports played : -1
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter number of sports played : 1.0
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter number of sports played : One
Invalid input, input cannot be a floating point or a negative number or a string, re-enter!
Enter number of sports played :
```

Figure 2.12 : Entering negative inputs, string, floating number for number of sports played

2.4 Calculate Nerd Score

Choose option 4 from the menu to calculate nerd score based on the three inputs – fandom score, hobbies score and number of sports played. Figure 2.13 shows the calculated nerd score when all three inputs are provided by the user.

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 4
Your nerd score is :  18.33030277982336
 ------------------------------------
```

Figure 2.13 : Choosing Number of Sports played

Even if one of the inputs are missing i.e. it has not been inputted by the user then error appears on the screen and the program prompts to enter the missing values as shown in figure 2.14

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 4
Fandom score missing!!
Hobbies score is missing!!
Number of sports played is missing!!
Please enter above missing input(s)!
 ------------------------------------
```

Figure 2.14

2.5 Print Nerd Rating

Choose option 5 from the menu to print the nerd rating of a student as shown in figure 2.15 Nerd rating is decided based on the range in which nerd score exists.

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 5
Your Nerd rating is xxx
 ------------------------------------
```

Figure 2.15 : Printing nerd rating

If nerd score is not calculated yet, program will throw a message asking the user to calculate the nerd score first as shown in figure 2.16

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 5
You have not calculated your Nerd Score yet! Please press 4 in the menu to calculate it!!
 ------------------------------------
```

Figure 2.16

2.6 To exit menu

Choose option 6 from the menu to exit the menu and come out of the program as shown in figure 2.17. To start the menu program again, re-run the code.

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 6
Exiting the menu

Process finished with exit code 0
```

Figure 2.17 : To exit menu

2.7 Reset the inputs

Choose option 7 from the menu to reset the inputs of the menu as shown in figure 2.17

```
 ------------------------------------
|Menu:
|1: Enter Fandom score
|2: Enter Hobbies score
|3: Enter Number of sports played
|4: Calculate nerd score
|5: Print nerd rating
|6: To exit menu
|7: Reset the inputs
 ------------------------------------
Enter choice : 7
Resetting the inputs
 ------------------------------------
```

Figure 2.18 : Reset the inputs

3. Task 2: Implement nerd score

This program calculates the skill score using formula:

$$x\sqrt{\frac{42y^2}{z+1}}$$

Where x = Fandom Score, y = Hobbies Score, and z = Number of Sports Played

Below figure 3.1 shows the output when all the three inputs are valid. Fandom score should be a non-zero positive integer, Hobbies score should be a positive integer which is a multiple of four including zero and Number of Sports played should also be a positive integer including zero.

```
if __name__ == '__main__':
    FandomScore, HobbiesScore, SportsNum = 1, 4, 1
    print("Fandom Score=", FandomScore, "\nHobbiesScore=", HobbiesScore, "\nSportsNum=", SportsNum)
    print(calculateSkillEquation(FandomScore, HobbiesScore, SportsNum))
```

```
skillEquation_30281229
C:\Users\deepa\PycharmProjects\Assignment1\venv\Scripts\python.exe C:/Users/deepa/Desktop/A1_302812
Fandom Score= 1
HobbiesScore= 4
SportsNum= 1
18.33030277982336
```

Figure 3.1 : Calculating Skill score using valid inputs

Below figure 3.2 shows the output when the input values are invalid for example if Fandom score is a string, Hobbies score is not a multiple of four and Number of Sports played is a negative number.

```
if __name__ == '__main__':
    FandomScore, HobbiesScore, SportsNum = "One", 2 , -1
    print("Fandom Score=", FandomScore, "\nHobbiesScore=", HobbiesScore, "\nSportsNum=", SportsNum)
    print(calculateSkillEquation(FandomScore, HobbiesScore, SportsNum))
```

```
skillEquation_30281229
C:\Users\deepa\PycharmProjects\Assignment1\venv\Scripts\python.exe C:/Users/deepa/Desktop/A1_30281
Fandom Score= One
HobbiesScore= 2
SportsNum= -1
Fandom score is not valid, please enter a non zero, non-negative integer
Hobbies score is not valid, please enter a non-negative integer which is a multiple of 4
Number of sports value is not valid, please enter a non-negative integer
None
```

Figure 3.2 : Calculating Skill score using invalid inputs

4. Task 3: Finding your Class

Based on the Skill Score calculation, user is allotted a Class based on the below table 1. The inputs provided to the program is in the form of a list which can contain any number of values. For each of the values to be valid, it should be only a positive integer and not a negative integer number or a string.

Score	Class	Position in the output list
0	Nerdlite	0
1	Nerdling	1
10	Nerdlinger	2
100	Nerd	3
500	Nerdington	4
1000	Nerdrometa	5
2000	Nerd Supreme	6

Table 1: Score thresholds and their associated Class

Below figure 4.1 shows the output of the program with valid inputs.

```
if __name__ == '__main__':
    # test cases
    # studentScore_list = []  #
    studentScore_list = [23, 76, 1300, 600]  # output should be [0, 0, 2, 0, 1, 1, 0]

    print(countStudentClass(studentScore_list))
```

countStudentClass()

findClass_30281229 (1)

```
C:\Users\deepa\PycharmProjects\Assignment1\venv\Scripts\python.exe C:/Users/deepa/Deskt
[0, 0, 2, 0, 1, 1, 0]

Process finished with exit code 0
```

Figure 4.1 : Finding Nerd Class using only valid inputs

Below figure 4.2 shows the output of the program with few inputs as invalid. The output displays the inputs which are invalid.

```
if __name__ == '__main__':
    # test cases
    # studentScore_list = []  #
    studentScore_list = [-23, "Seventy six", 1300, 600.5]

    print(countStudentClass(studentScore_list))
```

findClass_30281229 (1)

```
C:\Users\deepa\PycharmProjects\Assignment1\venv\Scripts\python.e
-23 is an invalid input
Seventy six is an invalid input
[0, 0, 0, 0, 1, 1, 0]
```

Figure 4.2 : Finding Nerd Class using few invalid inputs