**Module 5 Critical Thinking Assignment**

Shashi B. Thakur

Colarado State University Global

CSC500: Principles of Programming

Dr. Steven Evans

February 18, 2024

**Module 5 Critical Thinking Assignment**

**Git Hub Link –**

<https://github.com/shashithakurcsu/CSUProjects/blob/main/Module5/rainfall_calculator.py>

<https://github.com/shashithakurcsu/CSUProjects/blob/main/Module5/bookclub_award.py>

Part 1:

The objective of this assignment is to use nested loop to collect data and calculate the average rainfall over a period of years. Based on review of requirement here is pseudocode for the program.

**BEGIN**

Initialize total rainfall to 0.

Initialize total months to 0.

Prompt the user for total number of years.

Outer Loop – For each year in number of years

Inner Loop - For each month from 1 – 12

Ask user to enter the inches of rainfall for that month

Add this amount to total rainfall

Increment total month by 1

End Inner For Loop

End Outer For loop

Do calculation for average rainfall = total rainfall divided by total months

Handle division problem is invalid number of years entered

Display the number of months.

Display the total inches of rainfall

Display the average rainfall per month for the entire period.

END

There is no specific format for display in the requirement. I have displayed in 3 lines.

This section of program obtains user inputs for number of years and iterate thru each month to obtain data for rainfall

A computer screen with text

Description automatically generated

This section of program does average calculation and dsiplays result for the user

A screen shot of a computer program

Description automatically generated

Full Code

# This is a program to claculate average rainfall in a given number of years based on user input

#Intialization of variables; usage outside the loop

total\_rainfall = 0

total\_months = 0

# Prompt the user for the number of years and get input

num\_years = int(input("Enter the number of years: "))

# Outer loop for each year

for year in range(1, num\_years + 1):

# Inner loop for each month of the year

for month in range(1, 13):

# Ask user for rainfall for the month. Rainfall can be in decimals

rainfall = float(input(f"Enter the rainfall (in inches) for year {year}, month {month}: "))

# Add to total rainfall

total\_rainfall = total\_rainfall + rainfall

# Increment total months

total\_months = total\_months + 1

# Calculate average rainfall. Handle the scenario if user enter <=0 years for division by 0 problem

if(num\_years > 0):

average\_rainfall = total\_rainfall / total\_months

# Display the results

print(f"Total number of months: {total\_months}")

print(f"Total inches of rainfall: {total\_rainfall}")

print(f"Average rainfall per month: {average\_rainfall:.2f} inches")

else:

print(f"Invalid number of years entered: {num\_years}. Therefore no calculation performed")

Here is the sceen shot of program execution

Invalid years as input

A screen shot of a computer

Description automatically generated

Program execution for valid 2 years input

A screenshot of a computer program

Description automatically generated

GitHub Repositry - <https://github.com/shashithakurcsu/CSUProjects/blob/main/Module5/rainfall_calculator.py>

While this program has been created as per requirements but it can be easier for the user to enter for example comma seprated value for rainfall for each year.

Part 2

The objective of the Part 2 of the assignement is create a simple book club award system for CSU Global Library users based on number of books purchased this month

One of the challenge in this requirement is that, it doesn’t specify what to do if user enters odd number books upto seven. The program can handle any number more than 8. This needs further discussion about requirments of point system. Meanwhile I am assuming that if customer pusrchases say for example 1 book, she will get 0 points. Similarly if the customer purchases 3 books she will get 5 points and she purchases 5 books she will get 15 points.

**Pseudocode** based on requirement (along with assumed logic)

BEGIN

Ask the user to enter the number of books purchased this month.

Store the number entered by user into number of books purchased.

IF number of books purchased is 0 or 1 THEN

Set awards point to 0

ELSE IF number of books purchased is 2 or 3 THEN

Set awards point to 5

ELSE IF number of books purchased is 4 or 5 THEN

Set awards point to 15

ELSE IF number of books purchased is 6 or 7 THEN

Set awards point to 30

ELSE IF number of books purchased >= 8 THEN

Set awards point to 60

ENDIF

Display the number of points awarded.

END

Here is the Python code for the program based on the

# A program that asks the user to enter the number of books that they have purchased this month and then display the number of points awarded.

#C Obtain user input for numbet of books

num\_books\_purchased = int(input("Enter the number of books you have purchased this month: "))

# Initialize the awards point variable

awards\_point = 0

# Determine the awards point based on the number of books purchased

if num\_books\_purchased == 0 or num\_books\_purchased == 1:

awards\_point = 0

elif num\_books\_purchased == 2 or num\_books\_purchased == 3:

awards\_point = 5

elif num\_books\_purchased == 4 or num\_books\_purchased == 5:

awards\_point = 15

elif num\_books\_purchased == 6 or num\_books\_purchased == 7:

awards\_point = 30

elif num\_books\_purchased >= 8:

awards\_point = 60

# Display the number of points awarded

print(f"You have been awarded {awards\_point} points.")

# End of the program

Summary of code –

**User Input**: The program starts by prompting the user to enter the number of books they have purchased in a month, which is stored in the variable num\_books\_purchased.

**Award Points Logic**: Using a series of **if-elif** statements, the program checks the value of **books\_purchased** and sets the **awards\_point** variable according to the criteria specified in the requirements.

**Display Output**: Finally, the program prints out the number of award points the user has earned based on their input.

Program Execution Screenshot–

A screen shot of a computer

Description automatically generated

Github Code Repository –

<https://github.com/shashithakurcsu/CSUProjects/blob/main/Module5/bookclub_award.py>