**Module 5: Critical Thinking Assignment**

**Part 1:**

Write a program that uses nested loops to collect data and calculate the average rainfall over a period of years. The program should first ask for the number of years. The outer loop will iterate once for each year. The inner loop will iterate twelve times, once for each month. Each iteration of the inner loop will ask the user for the inches of rainfall for that month. After all iterations, the program should display the number of months, the total inches of rainfall, and the average rainfall per month for the entire period.

**Pseudocode:**

START

// Prompt user for the number of years

PROMPT "Enter the number of years: " AS years

// Initialize variables for total rainfall and total months

SET total\_rainfall TO 0

SET total\_months TO 0

// List of month names

SET months TO ["January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", "December"]

// Iterate over each year

FOR year FROM 1 TO years DO

// Iterate over each month

FOR EACH month IN months DO

// Prompt for rainfall for the current month and year

PROMPT "Enter amount of rainfall for " + month + " (year " + year + ") in inches: " AS monthly\_rainfall

// Convert input to a number and add to total rainfall

total\_rainfall += CONVERT monthly\_rainfall TO NUMBER

// Increment total months counter

total\_months += 1

END FOR

END FOR

// Calculate average rainfall

SET average\_rainfall TO total\_rainfall / total\_months

// Display total months, total rainfall, and average rainfall

PRINT "Months: " + total\_months

PRINT "Total Rainfall: " + total\_rainfall + " inches"

PRINT "Average Rainfall: " + FORMAT(average\_rainfall, 2) + " inches/month"

END

**Source Code:**

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

total\_rainfall, total\_months = 0, 0

months = ["January", "February", "March", "April", "May", "June", "July", "August", "September", "October", "November", "December"]

for year in range(1, years + 1):

for month in months:

prompt = f"Enter amount of rainfall for {month} (year {year}) in inches: "

total\_rainfall += float(input(prompt))

total\_months += 1

print(f"Months: {total\_months}\nTotal Rainfall: {total\_rainfall} inches\nAverage Rainfall: {total\_rainfall / total\_months:.2f} inches/month")

**Screenshot:**

A screenshot of a computer program

Description automatically generated

**Part 2:**

The CSU Global Bookstore has a book club that awards points to its students based on the number of books purchased each month. The points are awarded as follows:

* If a customer purchases 0 books, they earn 0 points.
* If a customer purchases 2 books, they earn 5 points.
* If a customer purchases 4 books, they earn 15 points.
* If a customer purchases 6 books, they earn 30 points.
* If a customer purchases 8 or more books, they earn 60 points.

**Pseudocode:**

START

// Define a function to calculate points based on books purchased

FUNCTION calculate\_points(books):

IF books >= 8 THEN

RETURN 60

ELSE IF books >= 6 THEN

RETURN 30

ELSE IF books >= 4 THEN

RETURN 15

ELSE IF books >= 2 THEN

RETURN 5

ELSE

RETURN 0

END FUNCTION

// Prompt user for the number of books purchased

PROMPT "How many books have you purchased this month? " AS books\_purchased

CONVERT books\_purchased TO INTEGER

// Calculate points awarded

SET points\_awarded TO calculate\_points(books\_purchased)

// Display points awarded

PRINT "Points awarded: " + points\_awarded

END

**Source Code:**

points = lambda books: 60 if books >= 8 else 30 if books >= 6 else 15 if books >= 4 else 5 if books >= 2 else 0  
  
books\_purchased = int(input("How many books have you purchased this month? "))  
print(f"Points awarded: {points(books\_purchased)}")

**Screenshot:**

A computer screen shot of a computer code

Description automatically generated

**GitHub Link:**

[**https://github.com/BirbSingularity/Module5**](https://github.com/BirbSingularity/Module5)