Week 10 Homework – Rooftop Gardens at COD

Write the Flowchart, and Python code for the following programming problem based on the pseudocode below. Be sure to upload your flowchart and WORKING & FULLY TESTED Python program to Blackboard.

What if COD decided to implemented rooftop gardens as a way to promote energy efficiency and save money? Let’s write a program that will allow the user to enter the energy bills from January to December for the year prior to going green (prior to implementing the rooftop gardens). Next, allow the user to enter the energy bills from January to December of the past year after implementing the rooftop gardens, or going green. The program should calculate the energy difference from the two years and display the two years’ worth of data, along with the savings.

Hints: Create three arrays of size 12 each. The first array will store the first year of energy costs, the second array will store the second year after going green, and the third array will store the difference. Also, create a string array that stores the month names. These variables might be defined as follows:

notGreenCost = [0] \* 12 goneGreenCost = [0] \* 12 savings = [0] \* 12

months = ['January', 'February', 'March', 'April', 'May', 'June', 'July', 'August', 'September', 'October',

'November', 'December']

Your sample output might look as follows:

Enter NOT GREEN energy costs for January

Enter now -->789

Enter NOT GREEN energy costs for February

Enter now -->790

Enter NOT GREEN energy costs for March Enter now -->890

Enter NOT GREEN energy costs for April

Enter now -->773

Enter NOT GREEN energy costs for May

Enter now -->723

Enter NOT GREEN energy costs for June Enter now -->759

Enter NOT GREEN energy costs for July

Enter now -->690

Enter NOT GREEN energy costs for August

Enter now -->681

Enter NOT GREEN energy costs for September

Enter now -->782

Enter NOT GREEN energy costs for October

Enter now -->791

Enter NOT GREEN energy costs for November Enter now -->898

Enter NOT GREEN energy costs for December

Enter now -->923

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Enter GONE GREEN energy costs for January

Enter now -->546

Enter GONE GREEN energy costs for February

Enter now -->536

Enter GONE GREEN energy costs for March

Enter now -->519

Enter GONE GREEN energy costs for April

Enter now -->493

Enter GONE GREEN energy costs for May

Enter now -->472

Enter GONE GREEN energy costs for June Enter now -->432

Enter GONE GREEN energy costs for July

Enter now -->347

Enter GONE GREEN energy costs for August

Enter now -->318

Enter GONE GREEN energy costs for September

Enter now -->453

Enter GONE GREEN energy costs for October

Enter now -->489

Enter GONE GREEN energy costs for November Enter now -->439

Enter GONE GREEN energy costs for December

Enter now -->516

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SAVINGS

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$ 243 $ 789 $ 546 January

$ 254 $ 790 $ 536 February

$ 371 $ 890 $ 519 March

$ 280 $ 773 $ 493 April

$ 251 $ 723 $ 472 May

$ 327 $ 759 $ 432 June

$ 343 $ 690 $ 347 July

$ 363 $ 681 $ 318 August

$ 329 $ 782 $ 453 September

$ 302 $ 791 $ 489 October

$ 459 $ 898 $ 439 November

$ 407 $ 923 $ 516 December

Do you want to end program? (Enter no or yes): yes

# The Pseudocode

Module main()

//Declare local variables Declare endProgram = “no”

While endProgram == “no”

Declare Real notGreenCost[12]

Declare Real goneGreenCost[12] Declare Real savings[12]

Declare String months[12] = “January”, “February”, “March”, “April”, “May”,

“June”, “July”, “August”, “September”, “October”, “November”, “December”

//function calls

getNotGreen(notGreenCost, months) getGoneGreen(goneGreenCost, months) energySaved(notGreenCost, goneGreenCosts,savings)

displayInfo(notGreenCost, goneGreenCosts, savings, months)

Display “Do you want to end the program? Yes or no”

Input endProgram

End While

End Module

Module getNotGreen(Real notGreenCost[], String months[])

Set counter = 0

While counter < 12

Display “Enter NOT GREEN energy costs for”, months[counter]

Input notGreenCosts[counter]

Set counter = counter + 1

End While

End Module

Module getGoneGreen(Real goneGreenCost[], String months[])

Set counter = 0

While counter < 12

Display “Enter GONE GREEN energy costs for”, months[counter]

Input goneGreenCosts[counter]

Set counter = counter + 1

End While

End Module

Module energySaved(Real notGreenCost[], Real goneGreenCost[], Real savings[])

Set counter = 0

While counter < 12

Set savings[counter] = notGreenCost[counter] – goneGreenCost[counter]

Set counter = counter + 1

End While

End Module

Module displayInfo(Real notGreenCost[], Real goneGreenCost[], Real savings[], String months[])

Set counter = 0

While counter < 12

Display “Information for”, months[counter]

Display “Savings $”, savings[counter]

Display “Not Green Costs $”, notGreenCost[counter]

Display “Gone Green Costs $”, goneGreenCost[counter]

End While

End Module

The Flowchart





# The Python Code

#######################################################

# Name: David White

# Class: CIS-1400

# Assignment: Lab 9-5

# File: lab9-5.py

# Purpose: energy efficiency savings

#######################################################

print('\n\*\*\*David White\*\*\*\n') # Display author's name

def main():

endProgram = "no"

print()

while endProgram == "no":

print()

# declare variables and arrays

notGreencost = [0] \* 12

goneGreencost = [0] \* 12

savings = [0] \* 12

months = ['January', 'February', 'March', 'April', 'May', 'June', 'July',

'August', 'September', 'October', 'November', 'December']

# function calls

notGreencost = getNotgreen(notGreencost, months)

goneGreencost = getGonegreen(goneGreencost, months)

savings = energySaved(notGreencost, goneGreencost, savings)

printInfo(notGreencost, goneGreencost, savings, months)

# input validation

endProgram = input("Do you want to end program? Enter yes or no")

while not (endProgram == "yes" or endProgram == "no"):

print("please enter a yes or no")

endProgram = input("Do you want to end program? Enter yes or no")

# end while

# end while

# get cost before going green

def getNotgreen(notGreencost, months):

# reset counter

counter = 0

while counter < len(months):

print("Enter NOT GREEN energy costs for", months[counter])

notGreencost[counter] = input("--> ")

# increment counter

counter = counter + 1

# extra line for separation

print()

# end while

return notGreencost

# get cost after going green

def getGonegreen(goneGreencost, months):

# reset counter

counter = 0

while counter < len(months):

print("Enter GONE GREEN energy costs for", months[counter])

goneGreencost[counter] = input("--> ")

# increment counter

counter = counter + 1

# extra line for separation

print()

# end while

return goneGreencost

# calculate savings

def energySaved(notGreencost, goneGreencost, savings):

# reset counter

counter = 0

while counter < len(savings):

savings[counter] = float(notGreencost[counter]) - float(goneGreencost[counter])

# increment counter

counter = counter + 1

# end while

return savings

# show info

def printInfo(notGreencost, goneGreencost, savings, months):

# reset counter

counter = 0

while counter < 12:

# print extra line for separation

print()

# displays month

print("Information for", months[counter])

# displays savings for current month

print("Savings: $", savings[counter])

# displays cost before going green

print("Not Green Costs: $", notGreencost[counter])

# displays cost after going green

print("Gone Green Costs: $", goneGreencost[counter])

# extra line for separation

print()

# increment counter

counter = counter + 1

# end while

# call main

main()