Week 9 Homework – Cellphone Data Charges

Create a flowchart for the problem below. Once your flowchart is complete, create Python code following the design in your flowchart.

Problem:

Do you have a cellphone plan that limits how much data you can use each month? What happens when you go over your data plan limit? You get charged more! Let’s write a program to figure out how to compute these charges! The program will be useful to many cellphone users.

Design and write a program that calculates and displays the number of gigabytes (GB) over the monthly contract GBs that a cellphone user incurred. The program should ask the user how many GBs were used during the month and how many GBs they were allowed. Validate the input as follows:

* The minimum GBs allowed should be at least 10, but not greater than 50. Validate input so that the GBs allowed are between 10 and 50.
* The GBs used must be over 0. Validate input so that the user does not enter a negative value.

Once correct data is entered, the program should calculate the number of GBs over the

GB allowed. If GBs were not over, print a message that they were not over the limit. If GBs were over, for every GB over, a 4.44 fee should be added to the monthly contract rate of 74.99. Be sure not to add the 4.44 fee for GBs 1 to the number of GBs allowed, but rather just GBs over. Display the number of GBs used, GBs allowed, the number of GBs over, and the total due that month.

You might consider the following functions:

* A function that allows the user to enter in GBs allowed within the range of 10 and

50.

* A function that allows the user to enter in the GBs used greater than or equal to 0.
* A function that calculates the total due and the total GBs over.
* A function that prints a monthly use report.

Your sample output might look as follows (note the validation code):

Sample 1 Showing Validation:

How many GBs are allowed: 5000

Please enter GBs between 10 and 50

How many GBs are allowed: 0

Please enter GBs between 10 and 50

How many GBs are allowed: 50

How many GBs were used: -10

Please enter GBs used of at least 0

How many GBs were used: 400

You were over your GBs by 350

---------------MONTHLY USE REPORT------------------

GBs allowed were 50

GBs used were 400

GBs over were 350

Total due is $ 1628.99

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

Please enter a yes or no

Do you want to end program? (Enter no or yes): 9

Please enter a yes or no

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

Sample 2 Showing GBs Over:

How many GBs are allowed: 20

How many GBs were used: 35

You were over your GBs by 15

---------------MONTHLY USE REPORT------------------

GBs allowed were 20

GBs used were 35

GBs over were 15

Total due is $ 141.79

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

Sample 3 Showing GBs Not Over:

How many GBs are allowed: 50

How many GBs were used: 49

You were not over your GBs for the month

---------------MONTHLY USE REPORT------------------

GBs allowed were 50

GBs used were 49 GBs over were 0 Total due is $ 74.99

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

The Pseudocode

Module main()

//Declare local variables

Declare String endProgram = “no”

While (endProgram == “no”

Declare Integer GBsAllowed = 0

Declare Integer GBsUsed = 0

Declare Real totalDue = 0

Declare Integer GBsOver = 0

//calls functions

Set GBsAllowed = getAllowed(GBsAllowed

Set GBsUsed = getUsed(GBsUsed

Set totalDue, GBsOver = calcTotal(GBsAllowed, GBsUsed, totalDue, GBsOver)

Call printData(GBsAllowed, GBsUsed, totalDue, GBsOver)

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

Input endProgram

While endProgram != “yes” or endProgram != “no”

Display “Please enter yes or no”

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

Input endProgram

End While

End While

End Module

Function Integer getAllowed(Integer GBsAllowed)

Display “How many GBs are allowed”

Input GBsAllowed

While GBsAllowed < 10 OR GBsAllowed > 50

Display “Please enter GBs between 10 and 50”

Display “How many GBs are allowed”

Input GBsAllowed

End While

Return GBsAllowed

End Function

Function Integer getUsed(Integer GBsUsed)

Display “How many GBs were used”

Input GBsUsed

While GBsUsed < 0

Display “Please enter GBs of at least 0”

Display “How many GBs were used”

Input GBsUsed

End While

Return GBsUsed

End Function

Function Real Integer calcTotal(Integer GBsAllowed, Integer GBsUsed, Real totalDue, Integer GBsOver)

Declare Real extra = 0

If GBsUsed <= GBsAllowed then

|  |  |
| --- | --- |
|  | Set totalDue = 74.99 |
|  | Set GBsOver = 0 |
| Else | Display “You were not over your GBs for the month” |
|  | Set GBsOver = GBsUsed – GBsAllowed |
|  | Set extra = GBsOver \* 4.44 |
|  | Set totalDue = 74.99 + extra |
|  | Display “You were over your GBs by”, GBsOver |

End If

Return totalDue, GBsOver

End Function

Module printData (Integer GBsAllowed, Integer GBsUsed, Real totalDue, Integer GBsOver)

Display “----------------MONTHLY USE REPORT----------------------“

Display “GBs allowed were”, GBsAllowed

Display “GBs used were”, GBsUsed

Display “GBs over were”, GBsOver

Display “Total due is $”, totalDue

The Flowchart







The Python Code

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

# Name: David White

# Class: CIS-1400

# Assignment: Lab 8-5

# File: lab8-5.py

# Purpose: calculate data overage charges

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

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

# main function

def main():

endProgram = "no"

while endProgram == "no":

# reset vars

GBAllowed = int(0)

GBUsed = int(0)

totalDue = float(0)

GBOver = int(0)

# call functions

GBAllowed = getAllowed()

GBUsed = getUsed()

totalDue, GBOver = calcTotal(GBAllowed, GBUsed)

printData(GBAllowed, GBUsed, totalDue, GBOver)

# check if user wants to end program

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

# input validation

while endProgram != "yes" and endProgram != "no":

print("Please enter yes or no")

endProgram = str(input("Do you want to edn the program? yes or no:"))

# end while

# end while

# get number of GBs allowed

def getAllowed():

GBAllowed = int(input("How many GBs are allowed:"))

# input validation

while GBAllowed < 10 or GBAllowed > 50:

print("Please enter a number between 10 and 50")

GBAllowed = int(input("How many GBs are allowed:"))

# end while

return GBAllowed

# get number of GBs used

def getUsed():

GBUsed = int(input("How many GBs were used:"))

# input validation

while GBUsed < 0:

print("Please enter a number of at least 0")

GBUsed = int(input("How many GBs were used:"))

# end while

return GBUsed

# calculate total

def calcTotal(GBAllowed, GBUsed):

if GBUsed <= GBAllowed:

totalDue = float(74.99)

GBOver = 0

print("You were not over your GBs for the month")

else:

GBOver = GBUsed - GBAllowed

extra = float(GBOver \* 4.44)

totalDue = float(74.99 + extra)

print("You were over your GBs by", GBOver)

# end if

return totalDue, GBOver

# show info

def printData(GBAllowed, GBUsed, totalDue, GBOver):

print("----------------MONTHLY USE REPORT----------------------")

print("GBs allowed were", GBAllowed)

print("GBs used were", GBUsed)

print("GBs over were", GBOver)

print("Total due is $", totalDue)

# call main

main()