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#importing the python libraries I will need
import matplotlib.pyplot as plt
import csv
from time import sleep
from numpy import array, average

global idnum
#creating empty lists
flen = []
billl = []
billd = []
bmass = []
idno = []
# opening the file and filling my empty lists with data from the csv file
with open('clean_penguins.csv', newline='') as csvfile:
    data = csv.DictReader(csvfile)
    for col in data:
        bmass.append(col['body_mass_g/100'])
        flen.append(col["flipper_length_mm"])
        billl.append(col["bill_length_mm"])
        billd.append(col['bill_depth_mm'])
        idno.append(int(col['id']))
    mass = [float(x) for x in bmass]
    flip = [float(x) for x in flen]
    bill = [float(x) for x in billl]
    depth = [float(x) for x in billd]

# for the bar plot
def barplot(data):
    idnum = int(input("Please enter penguin ID number"))

    if idnum > 333:
        print("please enter a valid value")
        barplot(data)
    elif idnum < 1:
        print("please enter a valid value")
        barplot(data)
    q = str(idno[idnum-1])
    a = bill[idnum-1]
    b = depth[idnum-1]
    c = flip[idnum-1]
    d = mass[idnum-1]

    Attribute = ['bill_length', 'bill_depth', 'flipper', 'mass']
    Value = [a, b, c, d]
    plt.bar(Attribute, Value, width=1)
    plt.title("Measurement for sample " + q)
    plt.xlabel("Attribute")
    plt.ylabel("Value")
    plt.show()
    init_function()

# function for the scatter plot
def scatter(data):
    print("Please choose an attribute to compare against the other attributes\n the\n attributes are as follows:\n bill_length_mm\n bill_depth_mm\n flipper_length_mm\n body_mass_g/100\n")
    scatterchoice = input("Please enter attribute?")

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if scatterchoice == "bill_length_mm":
    x = bill
    w = [[mass],
          [flip],
          [depth]
        ]
    avg = array(w)
    column_average = average(avg, axis=0)
    y = column_average
elif scatterchoice == "bill_depth_mm":
    x = depth
    w = [[mass],
          [flip],
          [bill]
        ]
    avg = array(w)
    column_average = average(avg, axis=0)
    y = column_average
elif scatterchoice == "flipper_length_mm":
    x = flip
    w = [[mass],
          [bill],
          [depth]
        ]
    avg = array(w)
    column_average = average(avg, axis=0)
    y = column_average
elif scatterchoice == "body_mass_g/100":
    x = mass
    w = [[bill],
          [flip],
          [depth]
        ]
    avg = array(w)
    column_average = average(avg, axis=0)
    y = column_average
else:
    print('Invalid input please choose enter the corect option')
    scatter(data)

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plt.title(scatterchoice + " comparison")
plt.xlabel("Body_mass_g/100 measurement")
plt.ylabel("Average of other attributes")
plt.xlim(0,250)
plt.ylim(0,150)
plt.scatter(x,y)
plt.plot([0,250],[0,150])
plt.show()
init_function()

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# a function for the main program

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sleep = 2

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def init_function():
    print("Welcome to penguin attribute analysis")

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    print("Please choose one of the following\n 1 - display a bar plot of penguin's
measuremeants\n 2 - display a scatter plot of attribute's measurements\n 3 - exit
the system\n")

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choice = input("Your choice?")

if choice == "1":
    barplot(data)
elif choice == "2":
    scatter(data)
elif choice == "3":
    print("please press Enter to exit program")
    exit()
else:
    print("Invalid input please choose the correct option")
    init_function()

init_function()
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