Problem Set 3: Python – Answer Key

November 5, 2024

1 Problem Set 3: Python – Answer Key

1.1 Introduction

Try to solve each problem using day three's material and some minimal Googling.

Do this problem set in a `.py` script. Use comments to indicate which question you're on.

This problem set should only take one hour.

2 Problem 1: Basic Operations

Create two numeric variables with any values and perform basic arithmetic operations (addition, subtraction, multiplication, division) on them. Assign the result of a division to a new variable and print it.

```python
[1]: a = 2
     b = 3

     print(a+b)
     print (a - b)
     print(a*b)

     c = a / b
     print(c)
```

```
5
-1
6
0.6666666666666666
```

3 Problem 2: Working with Vectors

Create a numeric vector with at least 5 elements. Compute the sum and mean of the vector. You will need to import the `numpy` package (or something similar) to compute the mean.

Use a logical comparison (true/false) within a for-loop to print if an element of the vector is greater than the mean. You may need to use the `print()` command.

```
[17]: # first part
      import numpy as np

      c = [1,2,3,4,5]

      print(sum(c))

      print(np.mean(c))

      # For loop

      myMean = np.mean(c)

      for i in range(0,5):
          print((c[i] > myMean))
```

```
15
3.0
False
False
False
True
True
```

4 Problem 3: Loop and Function

Write a function that takes a numeric input and returns the square of the number.

Use a for loop to apply this function to each element of a numeric vector that you create.

Store the results in a new vector that you first initialize by running `newVec = [999, 999, 999, 999, 999]`. Print the new vector using the `print()` command.

```
[22]: # Function
      def myF(x):
          y = x**2
          return(y)

      # Intialize newVec: intializing with random numbers (this was somewhat lazy⎵
       ↪coding, but )
      newVec = [999, 999, 999, 999, 999]

      # Loop
      for i in range(0, 5):
          newVec[i] = myF(c[i]) # using my vector from previous problem

      print(newVec)
```

```
[1, 4, 9, 16, 25]
```

5   Problem 4: Conditional Logic

Use a for loop and an if statment to replace values of the following vector with 999 if they are even.

vec = [1,2,3,4,5]

[28]:
```
vec = [1,2,3,4,5]

for i in range(0,5):
    if vec[i] % 2 == 0:   # Check if the element is even
        vec[i] = 999
    else:                 # This line and the next are not necessary
        vec[i] = vec[i]

print(vec)
```

[1, 999, 3, 999, 5]

6   Problem 5: Reflect

Write a brief reflection (1-3 sentences) on what you found challenging and what you learned from this problem set.