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Problem 4

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Final due Dec 14, 2022 07:30 +08

Problem 4-1

10/10 points (graded)

You are given the following function and class and function specifications for the two coding problems on this page (also available in this file, die.py):

die.py

Write a function called `makeHistogram(values, numBins, xLabel, yLabel, title=None)`, with the following specification:

```
def makeHistogram(values, numBins, xLabel, yLabel, title=None):
    """
      - values, a list of numbers
      - numBins, a positive int
      - xLabel, yLabel, title, are strings
      - Produces a histogram of values with numBins bins and the indicated labels
        for the x and y axes
      - If title is provided by caller, puts that title on the figure and otherwise
        does not title the figure
    """
```

Paste your entire function (including the definition) in the box.

Restrictions:

- Do not paste `import pylab` in the box.
- You should only be using the `pylab.hist`, `pylab.title`, `pylab.xlabel`, `pylab.ylabel`, `pylab.show` functions from the pylab module.
- Do not leave any debugging print statements when you paste your code in the box.

```
3     """
4       - values, a list of numbers
5       - numBins, a positive int
6       - xLabel, yLabel, title, are strings
7       - Produces a histogram of values with numBins bins and the indicated labels
8         for the x and y axes
9       - If title is provided by caller, puts that title on the figure and otherwise
10        does not title the figure
11    """
12    pylab.hist(values, bins = numBins)
13    pylab.xlabel(xLabel)
14    pylab.ylabel(yLabel)
15    if title != None:
16        pylab.title(title)
17    pylab.show()
```

Press ESC then TAB or click outside of the code editor to exit

Correct

Test results

See full output

CORRECT

output

Calculator

Submit You have used 1 of 30 attempts

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✔ Correct (10/10 points)

Problem 4-2

20/20 points (graded)

Write a function called `getAverage(die, numRolls, numTrials)`, with the following specification:

```
def getAverage(die, numRolls, numTrials):
    """
      - die, a Die
      - numRolls, numTrials, are positive ints
      - Calculates the expected mean value of the longest run of a number
        over numTrials runs of numRolls rolls.
      - Calls makeHistogram to produce a histogram of the longest runs for all
        the trials. There should be 10 bins in the histogram
      - Choose appropriate labels for the x and y axes.
      - Returns the mean calculated to 3 decimal places
    """
```

A run of numbers counts the number of times the same dice value shows up in consecutive rolls. For example:

- a dice roll of `1 4 3` has a longest run of 1
- a dice roll of `1 3 3 2` has a longest run of 2
- a dice roll of `5 4 4 4 5 5 2 5` has a longest run of 3

When this function is called with the test case given in the file, it will return `5.312`. Your simulation may give slightly different values.

Paste your entire function (including the definition) in the box.

Restrictions:

- Do not import or use functions or methods from `pylab`, `numpy`, or `matplotlib`.
- Do not leave any debugging print statements when you paste your code in the box.

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