KEY_Practice15_Intro_Stats_II

July 12, 2019

1 Practice with Statistics (Part 2)!

Remember: * Count statistics are a useful way of summarizing the items in a set of measurements. * `Counter` provides a useful class for counting lists of items. * Percentages tell you what fraction of a list consists of a given category.

First, import numpy and pandas and Counter:

[ ]:
```
# load numpy and pandas and Counter

import numpy as np
import pandas as pd
from collections import Counter
```

[ ]:
```
# mount Google Drive
from google.colab import drive
drive.mount('/content/gdrive')
path = '/content/gdrive/My Drive/SummerExperience-master/'
```

Load in the sample data from the Lesson:

[ ]:
```
# load the csv file: 'Lessons/SampleData/detroit_weather.csv'

data_table = pd.read_csv(path + 'Lessons/SampleData/detroit_weather.csv')
```

[ ]:
```
# Print the beginning of the table using the head function to remind you of the␣
 ↪format:

data_table.head()
```

[ ]:

	Unnamed: 0	YEAR	MONTH	DAY	Rain	Snow
0	0	1950	1	1	True	False
1	1	1950	1	2	True	False
2	2	1950	1	3	True	False
3	3	1950	1	4	True	True
4	4	1950	1	5	False	False

During the lesson, we looked at the rates of snow occurance, now we will repeat the same analysis for the occurance of rain.

[ ]:
```
# Count the number of days that have been raining since 1950
# and the number of days that haven't been
```

```
raining = Counter(data_table["Rain"])
raining
```

[ ]: Counter({True: 8051, False: 17263})

```
# What percentage of days since 1950 have been spent raining?

raining[True] / (raining[True] + raining[False])
```

[ ]: 0.3180453503989887

```
# How man days have been spent raining AND snowing?
# HINT: use a `and` statement in pandas

len(data_table.query('Rain and Snow'))
```

[ ]: 1095

```
# What percentage of days have been spent raining AND snowing?

len(data_table.query('Rain and Snow')) / len(data_table)
```

[ ]: 0.043256695899502255

```
# Calculate the percentage of days during the month you were born that were␣
 ↪spent raining:

june_rain = Counter(data_table.query('MONTH == 6')["Rain"])
june_rain[True] / (june_rain[True] + june_rain[False])
```

[ ]: 0.3685990338164251

CHALLENGE In the next lesson, we will look at climate change between the early 20th century and today, can you calculate a difference in days spent snowing between the 1950's and 2000's?

```
# Calculate a change in the percentage of days spent snowing
# during the 1950's and 2000's


snow_1950 = Counter(data_table.query('YEAR < 1960')["Snow"])
snow_2000 = Counter(data_table.query('YEAR < 2010 and YEAR >= 2000')["Snow"])

print("Snow days in 1950's", snow_1950[True] / (snow_1950[True] +␣
 ↪snow_1950[False]))
print("Snow days in 2000's", snow_2000[True] / (snow_2000[True] +␣
 ↪snow_2000[False]))
```

```
Snow days in 1950's 0.20208105147864183
Snow days in 2000's 0.16374589266155531
```

By how much did the percentage change from the 1950's to the 2000's? Did it increase or decrease?

Answer: 0.202 - 0.164 = 0.038 = decreased 3.8%

Nice job! You just practiced:

- Turning categorical variables into counts using `Counter`
- Calculating percentages from count variables
- Interpreting the results from basic statistical analysis