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1 Team Mango Components Three

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Yikai defined a function of returning statistical results and histogram figure with distribution of quantitative columns. For categorical column, he made a function to return a pie chart with different proportions of different categories. Besides, he defined another function to make a scatter plot based on its latitude and longitude columns.

```
In [22]: %matplotlib inline
         import numpy as np
         import matplotlib.pyplot as plt
         import csv
         import seaborn as sns
         from collections import Counter
         import ipywidgets
         from pylab import *
         import scipy.stats as stats
```

```
In [2]: data = {}
        with open("C://Users//hasee//Desktop//DV//sample_flat.csv", "r") as f:
            reader = csv.reader(f)
            header = next(reader)
            for k in header:
                data[k] = []
            for row in reader:
                for k, v in zip(header, row):
                    data[k].append(v)
```

```
In [3]: header
```

```
Out[3]: ['names',
         'dates',
         'latitude',
         'longitude',
         'categorical',
         'quant1',
         'quant2',
         'quant3']
```

```
In [29]: class Dataset:
             def __init__(self, data):
                 self.data = data

             def convert(self, column, dtype):
                 self.data[column] = np.array(self.data[column], dtype=dtype)

             def columns(self):
                 return self.data.keys()

             def filter_eq(self, column, value):
                 good = (self.data[column] == value)
                 new_data = {}
                 for column in self.data:
                     new_data[column] = self.data[column][good]
                 return Dataset(new_data)

             def filter_lt(self, column, value):
                 good = (self.data[column] < value)
                 new_data = {}
                 for column in self.data:
                     new_data[column] = self.data[column][good]
                 return Dataset(new_data)

             def filter_gt(self, column, value):
                 good = (self.data[column] > value)
                 new_data = {}
                 for column in self.data:
                     new_data[column] = self.data[column][good]
                 return Dataset(new_data)

             def filter_ne(self, column, value):
                 good = (self.data[column] != value)
                 new_data = {}
                 for column in self.data:
                     new_data[column] = self.data[column][good]
                 return Dataset(new_data)

             def size(self):
                 for key in self.data:
                     return self.data[key].size

             def split(self, column):
                 new_datasets = {}
                 for split_value in np.unique(self.data[column]):
                     new_datasets[split_value] = self.filter_eq(column, split_value
                 return new_datasets
```

```
            def stats(self):
                statistics = {}
                for key in self.data:
                    if self.data[key].dtype not in ("float", "int"):
                        continue
                    values = self.data[key]
                    statistics[key] = (values.min(), values.max(), values.std(), v
                return statistics

            def compare(self, other):
                stats1 = self.stats()
                stats2 = other.stats()
                for column in self.columns():
                    if column not in stats1: continue
                    print("Column '{0:25s}'".format(column))
                    for s1, s2 in zip(stats1[column], stats2[column]):
                        print("    {0} vs {1}".format(s1, s2))

            def plot_loc(self, x_column, y_column):
                plt.plot(self.data[x_column], self.data[y_column],'.')

            def plot_category(self, x_column):
                c=Counter(self.data[x_column])
                values=[]
                for item in c.values():
                    values.append(float(item))
                keys=c.keys()
                pie(values, labels=keys,
                        autopct='%1.1f%%', shadow=True, startangle=90)

            def plot_distplot(self, x_column):
                sns.set(color_codes=True)
                sns.distplot(self.data[x_column])
```

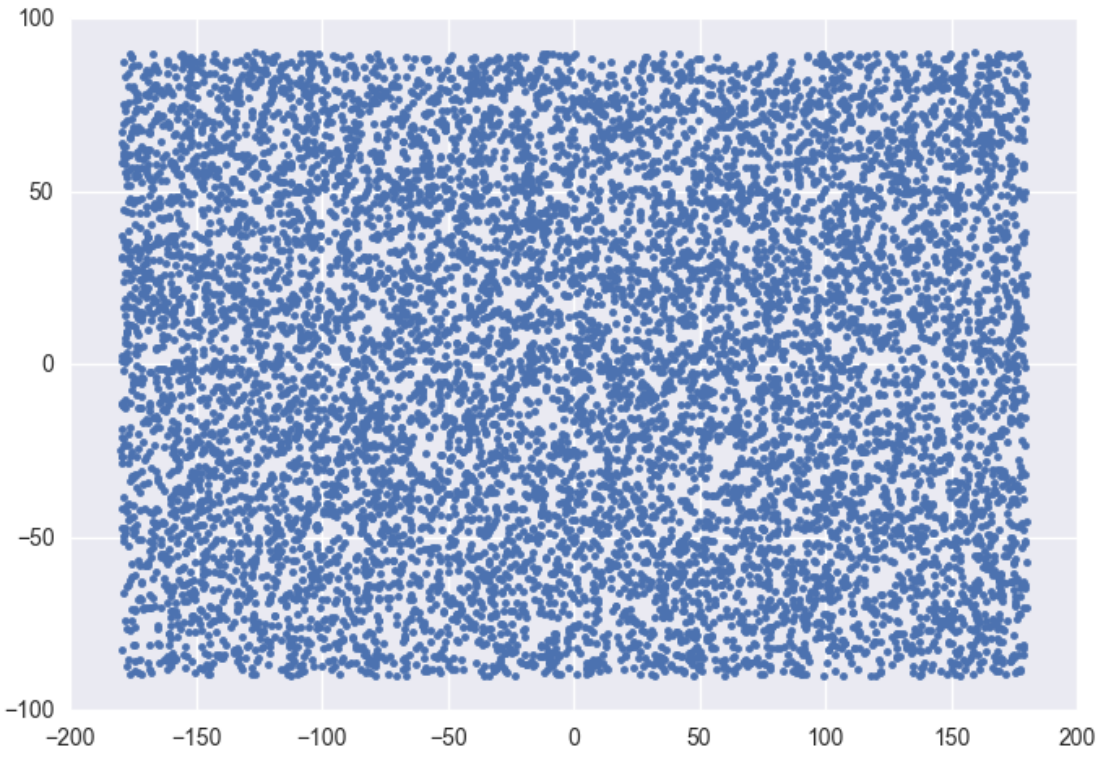
```
In [30]: d = Dataset(data)
```

```
In [31]: value_types = {'names':'str',
                        'dates':'str',
                        'latitude':'float',
                        'longitude':'float',
                        'categorical':'str',
                        'quant1':'float',
                        'quant2':'float',
                        'quant3':'float'}
```

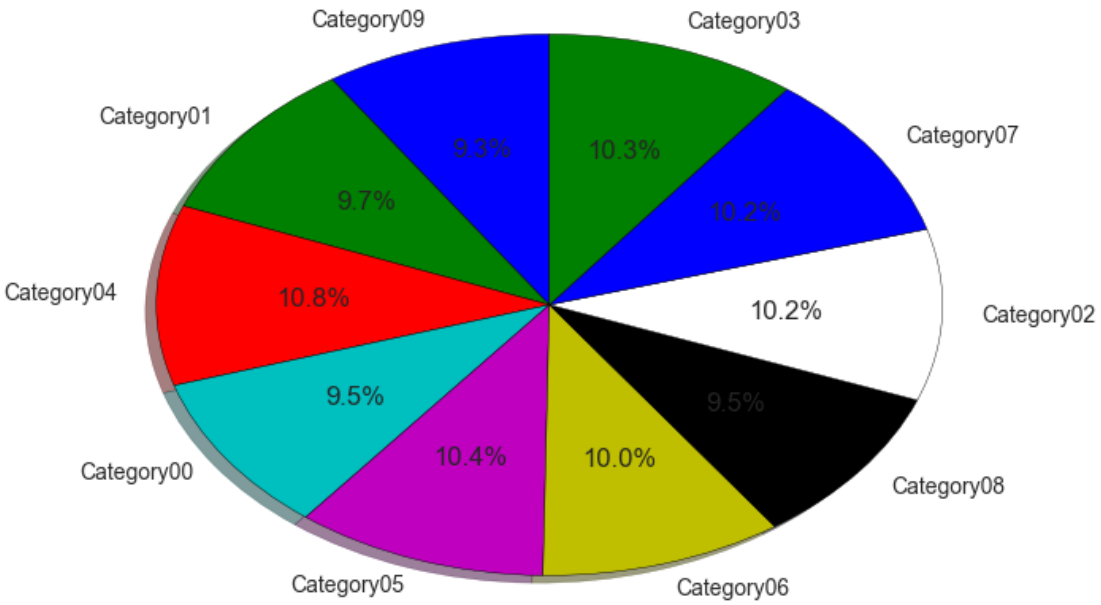
```
In [32]: for key in d.columns():
             d.convert(key, value_types.get(key,'str'))
```

```
In [8]: d.size()
```

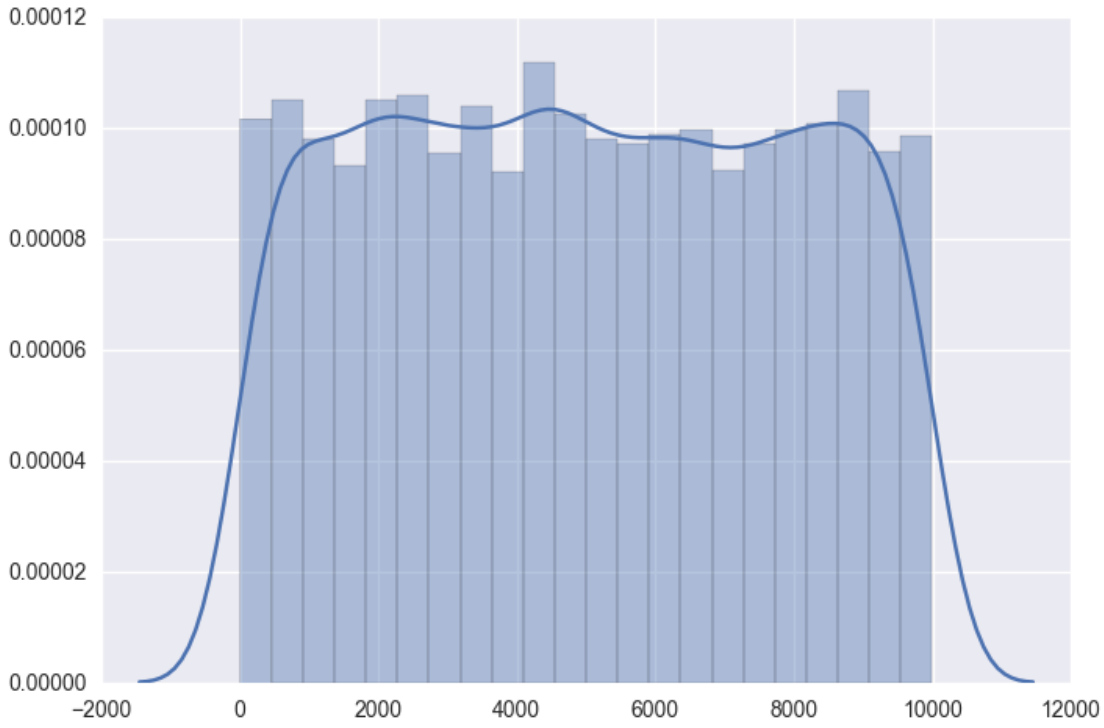
```
Out[8]: 10000

In [9]: d.columns()

Out[9]: dict_keys(['quant2', 'longitude', 'dates', 'categorical', 'latitude', 'quar

In [10]: stats1=d.stats()
         stats1

Out[10]: {'latitude': (-89.995630520000006,
           89.974703180000006,
           51.542993056366846,
           1.0263208923654998),
          'longitude': (-179.75694519999999,
           179.9466961,
           103.54112173893526,
           -0.082380171754900033),
          'quant1': (0.0013558789999999999,
           3.4998131209999999,
           1.0121408919091974,
           1.7370771337032003),
          'quant2': (-29.97977745,
           29.99403496,
           17.455537811363982,
           0.031579569049699996),
          'quant3': (0.72358315500000003,
           9999.3764539999993,
           2889.2689776495827,
           4980.3334926302578)}

In [11]: d.plot_loc('longitude','latitude')
```




```
In [12]: d.plot_category('categorical')
```



```
In [34]: d.plot_distplot('quant3')

C:\Users\hasee\Anaconda3\lib\site-packages\statsmodels\nonparametric\kdetools.py:20
  y = X[:m/2+1] + np.r_[0,X[m/2+1:],0]*1j
```




```
In [38]:

Out[38]: [("b'Nechuma'", 3),
          ("b'Mayrin'", 3),
          ("b'Jorrin'", 3),
          ("b'Annalise'", 3),
          ("b'Jamilia'", 3)]
```