Continous Sales

December 10, 2017

```
In [1]: import pandas as pd
        import numpy as np
        import matplotlib.pyplot as plt
        import seaborn as sns
        %matplotlib inline
```

```
/usr/local/lib/python2.7/dist-packages/pandas/core/computation/__init__.py:18: UserWarning: The
The minimum supported version is 2.4.6

  ver=ver, min_ver=_MIN_NUMEXPR_VERSION), UserWarning)
```

```
In [96]: continous= pd.read_csv('continous.csv')[1:]
```

```
In [97]: continous.head()
```

```
Out[97]:        Sales  Advertising    deltaa       profit
         1  17.070420    17.502916  0.944768  3370.834329
         2  20.554324    19.471040  0.112445  4219.193203
         3  22.559129    19.647133  0.009044  4803.025346
         4  23.684551    19.713817  0.003394  5133.983656
         5  24.311545    19.719574  0.000292  5321.506014
```

```
In [99]: continous.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 35 entries, 1 to 35
Data columns (total 4 columns):
Sales          35 non-null float64
Advertising    35 non-null float64
deltaa         35 non-null float64
profit         35 non-null float64
dtypes: float64(4)
memory usage: 1.2 KB
```

```
In [100]: continous.describe()
```

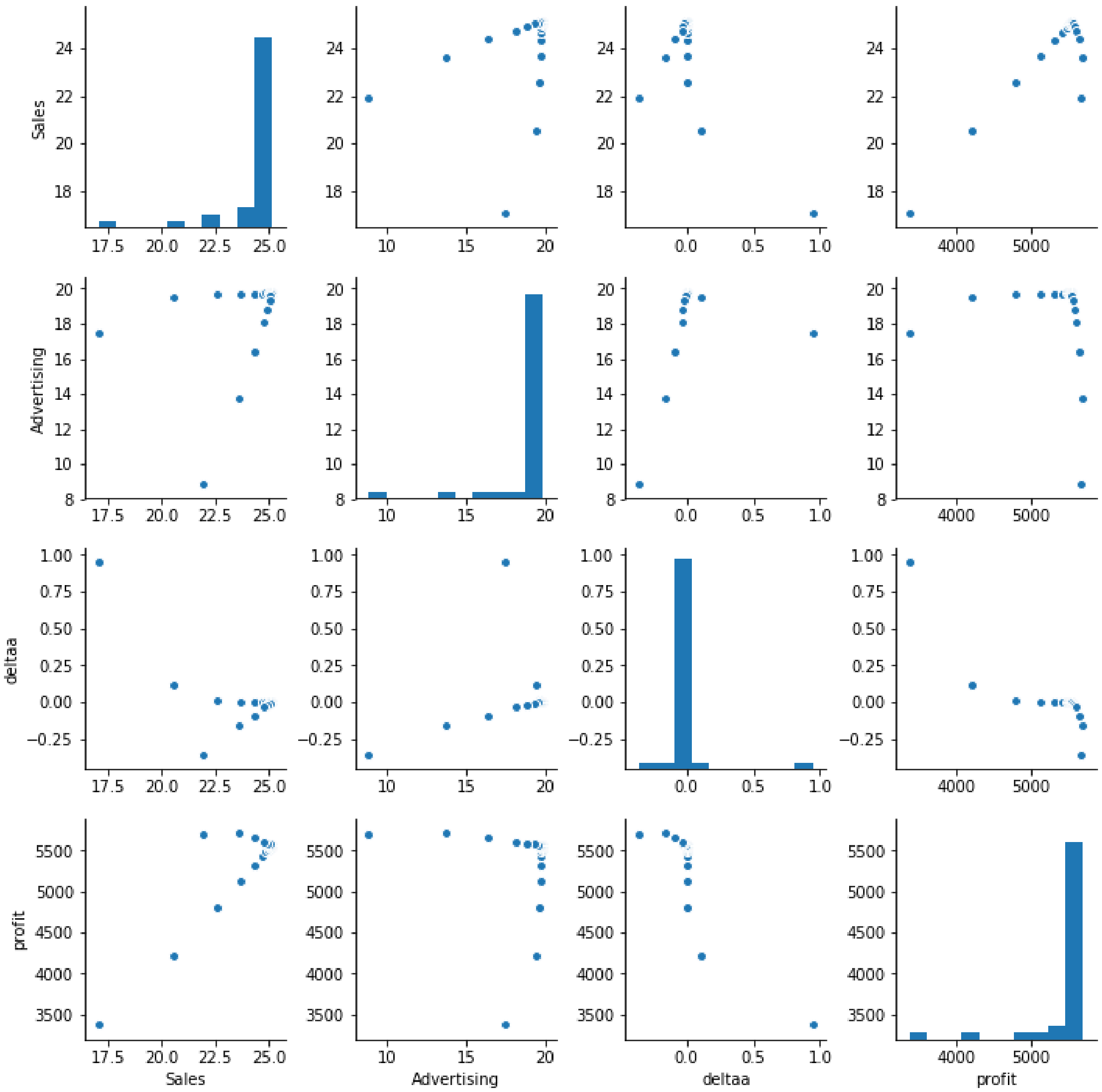
```
Out[100]:            Sales  Advertising     deltaa       profit
          count  35.000000    35.000000  35.000000    35.000000
          mean   24.409305    19.009933   0.010738  5421.798281
          std     1.634000     2.135366   0.176928   447.726059
          min    17.070420     8.878761  -0.354486  3370.834329
          25%    24.701843    19.598134  -0.001427  5537.786125
          50%    25.080854    19.740819  -0.000112  5555.949732
          75%    25.109330    19.778578   0.000313  5558.078009
          max    25.119914    19.803305   0.944768  5711.706867
```

```
In [101]: continous.columns
```

```
Out[101]: Index([u'Sales', u'Advertising', u'deltaa', u'profit'], dtype='object')
```

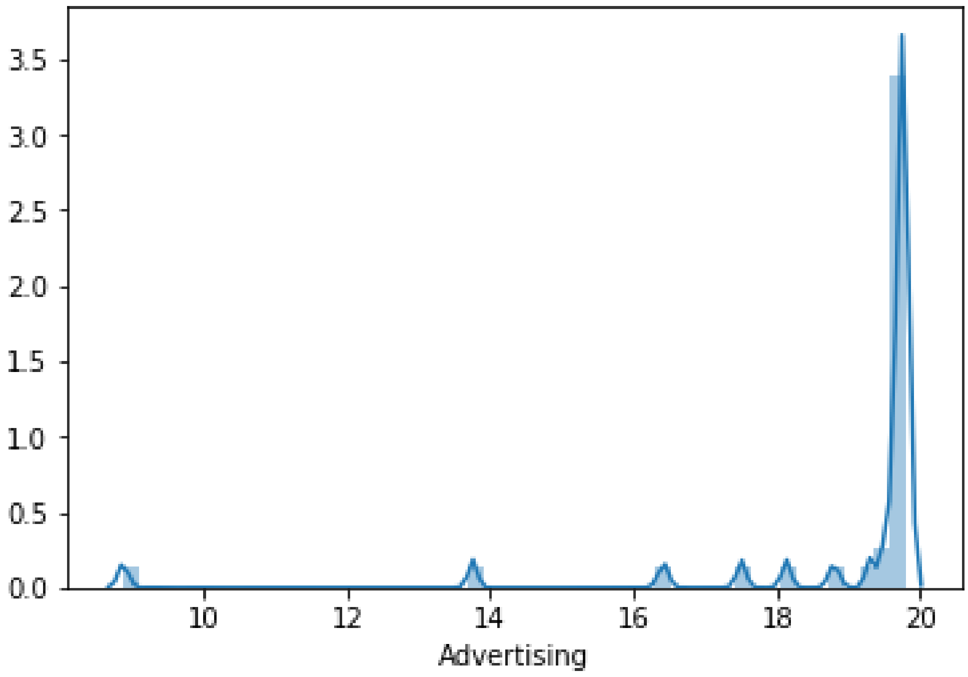
```
In [102]: sns.pairplot(continous)
```

```
Out[102]: <seaborn.axisgrid.PairGrid at 0x7fbd172830d0>
```



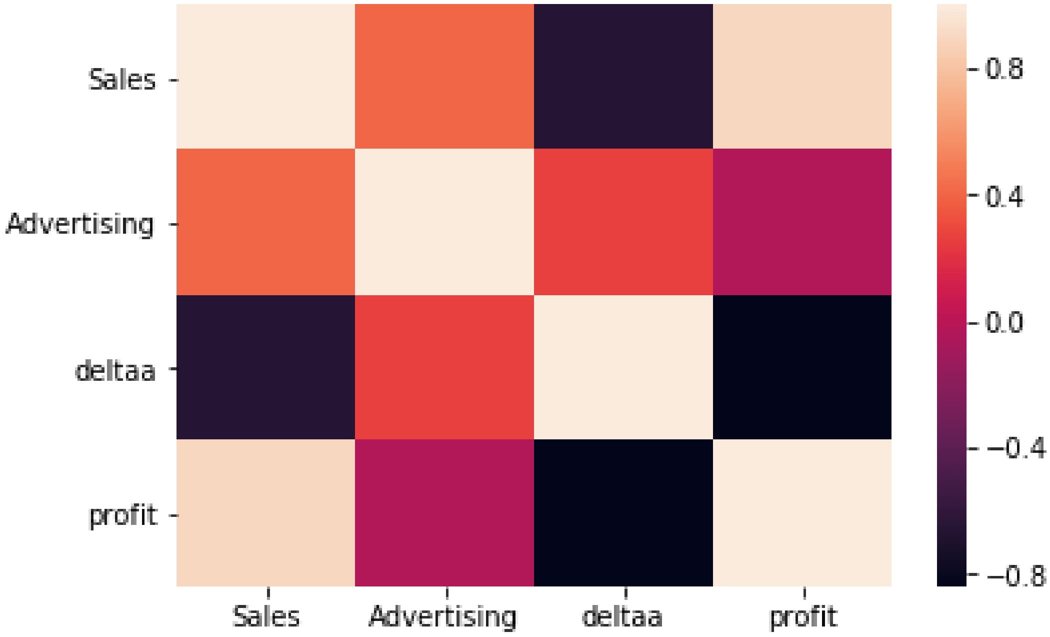
```
In [103]: sns.distplot(continous['Advertising'])
```

```
Out[103]: <matplotlib.axes._subplots.AxesSubplot at 0x7fbd169b2650>
```



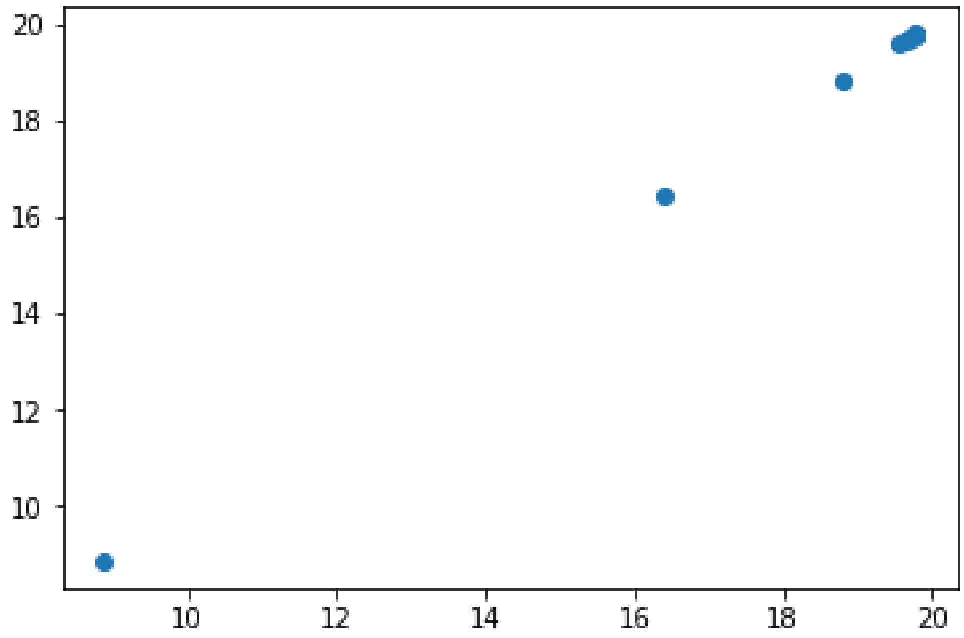
```
In [104]: sns.heatmap(continous.corr())
```

```
Out[104]: <matplotlib.axes._subplots.AxesSubplot at 0x7fbd171578d0>
```

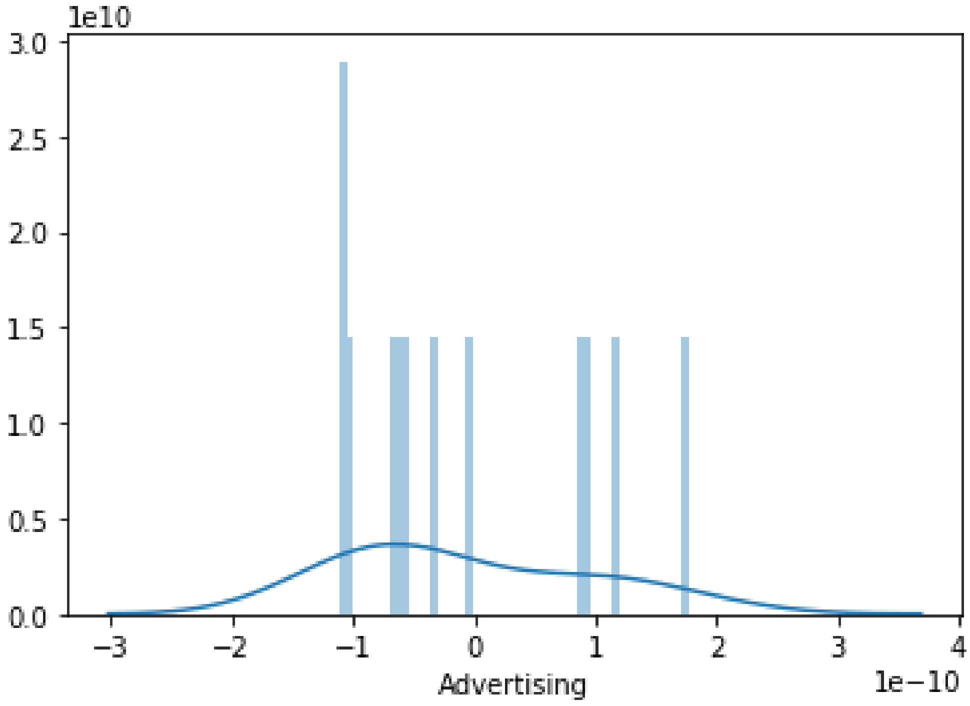


```
In [105]: X = continous.drop('Advertising', axis=1)
          y = continous['Advertising']

In [106]: from sklearn.model_selection import train_test_split

In [107]: X_train, X_test, y_train, y_test = train_test_split(X, y, test_size= 0.33, random_stat

In [108]: from sklearn.linear_model import LinearRegression

In [109]: lm = LinearRegression()

In [110]: lm.fit(X_train,y_train)

Out[110]: LinearRegression(copy_X=True, fit_intercept=True, n_jobs=1, normalize=False)

In [111]: print(lm.intercept_)

3.38996386517e-10


In [112]: coeff_df = pd.DataFrame(lm.coef_,X.columns,columns=['Coefficient'])
          coeff_df

Out[112]:          Coefficient
          Sales   3.000000e+00
          deltaa  7.515567e-11
          profit -1.000000e-02
```

```
In [113]: predictions = lm.predict(X_test)

In [114]: plt.scatter(y_test,predictions)

Out[114]: <matplotlib.collections.PathCollection at 0x7fbd1695aad0>
```



```
In [115]: sns.distplot((y_test-predictions),bins=50);
```



```
In [116]: from sklearn import metrics
```

```
In [117]: print('MAE:', metrics.mean_absolute_error(y_test, predictions))
          print('MSE:', metrics.mean_squared_error(y_test, predictions))
          print('RMSE:', np.sqrt(metrics.mean_squared_error(y_test, predictions)))
```

```
('MAE:', 8.4649324586886606e-11)
('MSE:', 8.9983434830383447e-21)
('RMSE:', 9.4859598792311702e-11)
```