PRACTICAL-2

A-Fixer Uilities

```
#Program to demonstrate fixer utilities
#Removing leading or lagging spaces from a data entry
print("#Removing leading or lagging spaces from a data entry")
baddata="  Datascience with too many spaces is bad   "
print('>',baddata,'<')
cleandata=baddata.strip()
print(">",cleandata,"<")
#Removing non-printable characters from the dataentry
print("\n#Removing non-printable characters from the data entry")
import string
printable=set(string.printable)
baddata="Data\x00science with too many funny\x01 characters is \x10bad!!!"
cleandata=''.join(filter(lambda x:x in string.printable,baddata))
print("Baddata:",baddata)
print("Cleandata:",cleandata)
print('\n#Reformatting date entry to match specific formatting criteria')
print('#Convert YYYY/MM/DD TO DD Month YYYY')
import datetime
baddate = datetime.date(2019,10,31)
baddata = format(baddate,'%Y-%m-%d')
gooddate = datetime.datetime.strptime(baddata,'%Y-%m-%d')
gooddata = format(gooddate,'%d %B %Y')
print('BadData: ',baddata)
print('GoodData: ',gooddata)
```

OutPut:

```
#Removing leading or lagging spaces from a data entry
>    Datascience with too many spaces is bad    <
> Datascience with too many spaces is bad <
#Removing non-printable characters from the data entry
Baddata: Data?science with too many funny characters is bad!!!
Cleandata: Datascience with too many funny characters is bad!!!
#Reformatting date entry to match specific formatting criteria
#Convert YYYY/MM/DD TO DD Month YYYY
BadData:  2019-10-31
GoodData:  31 October 2019
```

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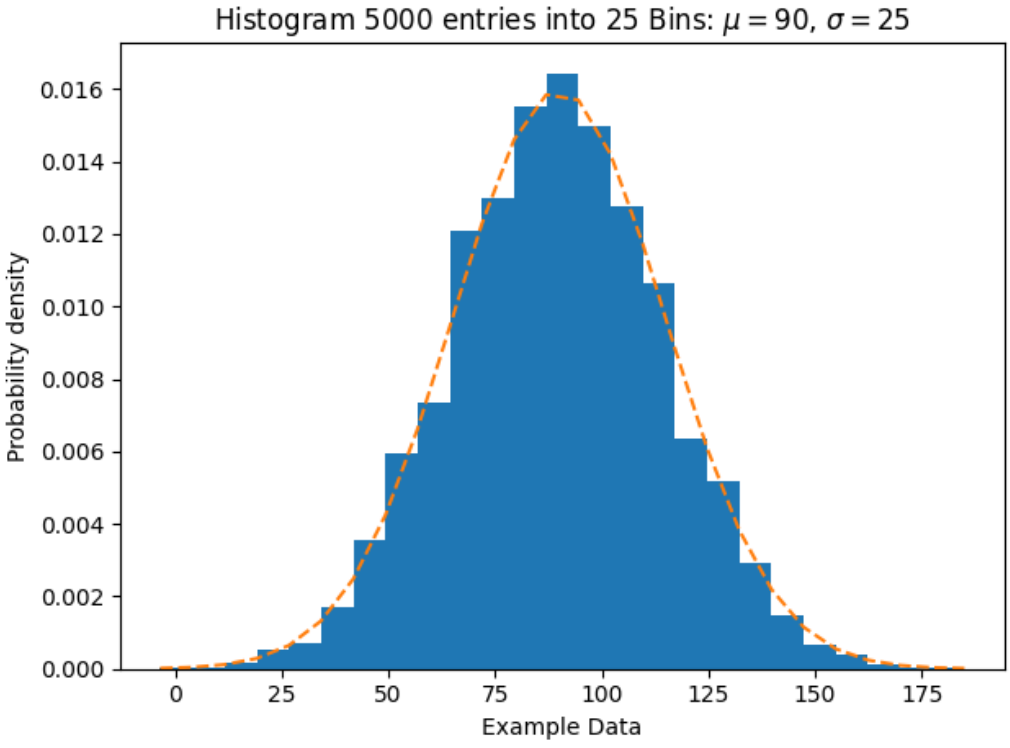
B-Data Binning

```
import numpy as np
import matplotlib.mlab as mlab
import matplotlib.pyplot as plt
import scipy.stats as stats
np.random.seed(0)
# example data
mu = 90 # mean of distribution
sigma = 25 # standard deviation of distribution
x = mu + sigma * np.random.randn(5000)
num_bins = 25
fig, ax = plt.subplots()
# the histogram of the data
n, bins, patches = ax.hist(x, num_bins, density=1)
# add a 'best fit' line
y = stats.norm.pdf(bins, mu, sigma)
# mlab.normpdf(bins, mu, sigma)
ax.plot(bins, y, '--')
ax.set_xlabel('Example Data')
ax.set_ylabel('Probability density')
sTitle=r'Histogram ' + str(len(x)) + ' entries into ' + str(num_bins)
+ ' Bins: $\mu=' + str(mu) + '$, $\sigma=' +str(sigma) + '$'
ax.set_title(sTitle)
fig.tight_layout()
sPathFig = ' /content/Histogram.png'
fig.savefig(sPathFig)
plt.show()
```



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C-Averaging Of Data

```
import pandas as pd
InputFileName='IP_DATA_CORE.csv'
OutputFileName='Retrieve_Router_Location.csv'
Base='C:/VKHCG'
print('Working Base :',Base, ' using ')
sFileName=Base + '/01-Vermeulen/00-RawData/' + InputFileName
print('Loading :',sFileName)
IP_DATA_ALL=pd.read_csv(sFileName,header=0,low_memory=False,usecols
=['Country','Place Name','Latitude','Longitude'], encoding="latin-1")
IP_DATA_ALL.rename(columns={'Place Name': 'Place_Name'}, inplace=True)
AllData=IP_DATA_ALL[['Country', 'Place_Name','Latitude']]
print(AllData)
MeanData=AllData.groupby(['Country', 'Place_Name'])['Latitude'].mean()
print(MeanData)
```

OutPut:

```
    Country Place_Name  Latitude
0         BW   Gaborone  -24.6464
1         BW   Gaborone  -24.6464
2         BW   Gaborone  -24.6464
3         BW   Gaborone  -24.6464
4         BW   Gaborone  -24.6464
..       ...         ...       ...
194       DZ    Algiers   36.7631
195       DZ    Algiers   36.7631
196       DZ    Algiers   36.7631
197       DZ    Algiers   36.7631
198       DZ    Algiers   36.7631

[199 rows x 3 columns]
------------(MEAN)-------------
Country  Place_Name
BW       Gaborone       -24.6464
DZ       Algiers         36.7631
GH       Accra           5.5500
         Kumasi          6.6833
         Takoradi        4.8833
         Tema            5.6167
MZ       Maputo          -25.9653
NE       Niamey          13.5167
Name: Latitude, dtype: float64
```

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D-Outliers Detection

```
import pandas as pd
InputFileName='IP_DATA_CORE.csv'
OutputFileName='Retrieve_Router_Location.csv'
Base='C:/VKHCG'
print('Working Base :',Base)
sFileName=Base + '/01-Vermeulen/00-RawData/' + InputFileName
print('Loading :',sFileName)
IP_DATA_ALL=pd.read_csv(sFileName,header=0,low_memory=False,usecols
=['Country','Place Name','Latitude','Longitude'], encoding="latin-1")
IP_DATA_ALL.rename(columns={'Place Name': 'Place_Name'}, inplace=True)
LondonData=IP_DATA_ALL.loc[IP_DATA_ALL['Place_Name']=='London']
AllData=LondonData[['Country', 'Place_Name','Latitude']]
print('All Data\n', AllData)
MeanData=AllData.groupby(['Country', 'Place_Name'])['Latitude'].mean()
StdData=AllData.groupby(['Country', 'Place_Name'])['Latitude'].std()
print('Outliers')
UpperBound=float(MeanData+StdData)
print('Higher than ', UpperBound)
OutliersHigher=AllData[AllData.Latitude>UpperBound]
print(OutliersHigher)
LowerBound=float(MeanData-StdData)
print('Lower than ', LowerBound)
OutliersLower=AllData[AllData.Latitude<LowerBound]
print(OutliersLower)
print('Not Outliers')
OutliersNot=AllData[(AllData.Latitude>=LowerBound) &
(AllData.Latitude<=UpperBound)]
print(OutliersNot)
```

Output:

```
All Data
Empty DataFrame
Columns: [Country, Place_Name, Latitude]
Index: []
Outliers
Higher than  Series([], Name: Latitude, dtype: float64)
```