Q1: A CSV file has been provided to you at this link. The given dataset is related to superstore products and contains 21 columns. In the given dataset, “Sales” is the target variable (i.e., the output).

i) Load the CSV data with the help of pandas and report the information regarding column labels, column data types, memory usage, the number of non-null values in each column and statistical details like mean, count, and standard deviation.

ii) Find out the numerical and categorical features from the data.

```
import pandas as pd
import numpy as np
import statistics as st
data = pd.read_csv('/content/Superstore.csv', encoding="windows-1252")
#print(data)
count=0
print(data.columns)
print('\n')
print(data.info())
print('\n')
print(data.mean())
print('\n')
print(data.count())
print('\n')
print(data.std())
print('\n')
print(data.notnull())
```

```
      Row ID  Order ID  Order Date  Ship Date  Ship Mode  Customer ID  \
0       True      True        True       True       True         True
1       True      True        True       True       True         True
2       True      True        True       True       True         True
3       True      True        True       True       True         True
4       True      True        True       True       True         True
...      ...       ...         ...        ...        ...          ...
9989    True      True        True       True       True         True
9990    True      True        True       True       True         True
9991    True      True        True       True       True         True
9992    True      True        True       True       True         True
9993    True      True        True       True       True         True

      Customer Name  Segment  Country  City  ...  Postal Code  Region  \
0              True     True     True  True  ...         True    True
1              True     True     True  True  ...         True    True
2              True     True     True  True  ...         True    True
3              True     True     True  True  ...         True    True
4              True     True     True  True  ...         True    True
...             ...      ...      ...   ...  ...          ...     ...
9989           True     True     True  True  ...         True    True
9990           True     True     True  True  ...         True    True
```

```
9991          True     True     True  True  ...         True    True
9992          True     True     True  True  ...         True    True
9993          True     True     True  True  ...         True    True

      Product ID  Category  Sub-Category  Product Name  Sales  Quantity  \
0           True      True          True          True   True      True
1           True      True          True          True   True      True
2           True      True          True          True   True      True
3           True      True          True          True   True      True
4           True      True          True          True   True      True
...          ...       ...           ...           ...    ...       ...
9989        True      True          True          True   True      True
9990        True      True          True          True   True      True
9991        True      True          True          True   True      True
9992        True      True          True          True   True      True
9993        True      True          True          True   True      True

      Discount  Profit
0         True    True
1         True    True
2         True    True
3         True    True
4         True    True
...        ...     ...
9989      True    True
9990      True    True
9991      True    True
9992      True    True
9993      True    True

[9994 rows x 21 columns]
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:11: FutureWarning: Dropp

  # This is added back by InteractiveShellApp.init_path()
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:15: FutureWarning: Dropp
```

Q2: With the help of NumPy operations, solve the following questions.

i) Create an array of random floats with a range starting from 0 to 2.

ii) Show the standard deviation and mean of the above-generated data.

```
import numpy as np
a = np.random.uniform(low=0,high=2,size=(20)) #random matrix
print(a)
print(a.mean()) #mean of a
print(a.std()) #standard deviationn of a
```

```
[0.41293066 1.69043424 0.07429957 0.97820425 1.25359235 1.16839121
 1.41151559 0.93891978 1.96476158 1.67350326 1.42077082 1.2702652
 1.24134264 1.23910427 0.09986302 0.54259766 0.12937108 1.255927
 1.2588193  0.83448462]
```

```
1.0429549055132763
0.5289047109786191
```

Q2 iii) Generate a random matrix of size (3,3) and find out the determinant, inverse, eigen values, and eigen vectors of that.

```
import numpy as np
a = np.random.uniform(low=0,high=2,size=(3,3))
print(a) #random matrix
print('\n')
print(np.linalg.det(a))·#determinant
print('\n')
print(np.linalg.inv(a)) #inverse
print('\n')
w, v = np.linalg.eig(a)
print(w) #eigen value
print('\n')
print(v) #eigen vector
```

```
[[1.01439616 1.32522905 1.69121904]
 [1.9436533  1.27584985 0.09586698]
 [0.40230444 0.56415059 0.16449766]]


0.7718089266714602


[[ 0.20185164  0.95374013 -2.63108625]
 [-0.36428538 -0.66534491  4.13301306]
 [ 0.75567032 -0.05069475 -1.66047397]]


[ 3.07049461+0.j         -0.30787547+0.39569655j -0.30787547-0.39569655j]


[[ 0.65396875+0.j          0.58847418-0.16192599j  0.58847418+0.16192599j]
 [ 0.72057629+0.j         -0.73134727+0.j         -0.73134727-0.j        ]
 [ 0.23042284+0.j          0.15086957+0.26428708j  0.15086957-0.26428708j]]
```

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