

Q.10) Take the iris dataset & calculate the mean, variance, kurtosis, and skewness. Plot the graph of mean, variance, kurtosis, and skewness for the dataset.

```
#iris stats_mvks
import pandas as pd
import numpy as np
import scipy.stats as stats
import matplotlib.pyplot as plt

#load the dataset
data = pd.read_csv('C:/Users/HP/OneDrive/Desktop/ml 7th sem codes/datasets/iris.csv')

data
#data.head()
```

```
[1]:
```

	sepal.length	sepal.width	petal.length	petal.width	variety
0	5.1	3.5	1.4	0.2	Setosa
1	4.9	3.0	1.4	0.2	Setosa
2	4.7	3.2	1.3	0.2	Setosa
3	4.6	3.1	1.5	0.2	Setosa
4	5.0	3.6	1.4	0.2	Setosa
...
145	6.7	3.0	5.2	2.3	Virginica
146	6.3	2.5	5.0	1.9	Virginica
147	6.5	3.0	5.2	2.0	Virginica
148	6.2	3.4	5.4	2.3	Virginica
149	5.9	3.0	5.1	1.8	Virginica

150 rows × 5 columns

```
#drop 'variety' col
```

```
data = data.drop('variety', axis=1)
```

```
data
```

```
[2]:
```

	sepal.length	sepal.width	petal.length	petal.width
0	5.1	3.5	1.4	0.2
1	4.9	3.0	1.4	0.2
2	4.7	3.2	1.3	0.2
3	4.6	3.1	1.5	0.2
4	5.0	3.6	1.4	0.2
...
145	6.7	3.0	5.2	2.3
146	6.3	2.5	5.0	1.9
147	6.5	3.0	5.2	2.0
148	6.2	3.4	5.4	2.3
149	5.9	3.0	5.1	1.8

150 rows × 4 columns

```
# Calculate mean, variance, kurtosis, and skewness for the entire dataset
```

```
mean = data.mean() #colwise mean
```

```
variance = data.var()
```

```
kurtosis = stats.kurtosis(data)
```

```
skewness = stats.skew(data)
```

```
# Print the results for each cols
```

```
print("Mean:")
```

```
print(mean)
```

```
print("\nVariance:")
```

```
print(variance)
```

```
print("\nKurtosis:")
```

```
print(kurtosis)
```

```
print("\nSkewness:")
```

```
print(skewness)
```

```
#print the overall results
```

```
print("\nOverall Mean:")
```

```
print(np.mean(mean))
```

```
print("\nOverall Variance:")
```

```
print(np.var(variance))
```

```
print("\nOverall Kurtosis:")
```

```
print(stats.kurtosis(kurtosis))
```

```
print("\nOverall Skewness:")
```

```
print(stats.skew(skewness))
```

```
Mean:
sepal.length    5.843333
sepal.width     3.057333
petal.length    3.758000
petal.width     1.199333
dtype: float64

Variance:
sepal.length    0.685694
sepal.width     0.189979
petal.length    3.116278
petal.width     0.581006
dtype: float64

Kurtosis:
[-0.57356795  0.18097632 -1.39553589 -1.33606741]

Skewness:
[ 0.31175306  0.31576711 -0.27212767 -0.10193421]

Overall Mean:
3.4645000000000006

Overall Variance:
1.3317599164143141

Overall Kurtosis:
-1.3980510418361585

Overall Skewness:
-0.159158086545934
```

```
#plot results
```

```
plt.figure(figsize=(12, 8))
```

```
plt.plot(mean,label='mean', marker='o')
```

```
plt.plot(variance,label='variance', marker='o')
```

```
plt.plot(kurtosis,label='kurtosis', marker='o')  
plt.plot(skewness,label='skewness', marker='o')  
plt.title('plotting of mean,variance,kurtosis,skewness')  
plt.legend()  
plt.grid(True)  
plt.show()
```

