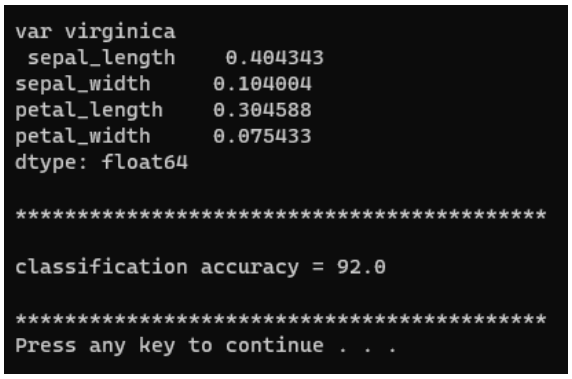
PROBLEM #1 OUTPUT

Classification Accuracy



CONCLUSION

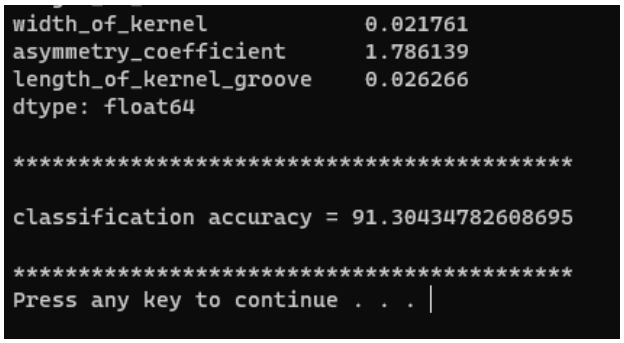
The resulting output from the test set is 92%.

With an accuracy of 92%, the classifier seems to be reasonably effective in distinguishing between the three species of iris flowers based on the 4 provided features.

Overall, the output suggests that the Naive Bayes classifier, trained on the Iris dataset, has performed well in predicting the species of iris flowers based on their features.

PROBLEM #2 OUTPUT

Classification Accuracy



CONCLUSION

The resulting output from the test set is 91.3%.

With an accuracy of 91.3%, the classifier seems to be reasonably effective in distinguishing between the three classes of wheat seed based on the 7 provided features. Besides that, other features of wheat seed that are available can be considered to improve model's performance.

Overall, the output suggests that the Naive Bayes classifier, trained on the Wheat seed dataset, has performed well in predicting the classes of seeds based on their features.

Other outputs (problem #1)

```
mean setosa
 sepal_length    5.006
sepal_width     3.418
petal_length    1.464
petal_width     0.244
dtype: float64

mean versicolor
 sepal_length    5.936
sepal_width     2.770
petal_length    4.260
petal_width     1.326
dtype: float64

mean virginica
 sepal_length    6.588
sepal_width     2.974
petal_length    5.552
petal_width     2.026
dtype: float64

var setosa
 sepal_length    0.124249
sepal_width     0.145180
petal_length    0.030106
petal_width     0.011494
dtype: float64

var versicolor
 sepal_length    5.936
sepal_width     2.770
petal_length    4.260
petal_width     1.326
dtype: float64

var virginica
 sepal_length    0.404343
sepal_width     0.104004
petal_length    0.304588
petal_width     0.075433
dtype: float64
```

```
    sepal_length  sepal_width  petal_length  petal_width     species
0            6.9          3.2           5.7          2.3   virginica
1            6.5          3.0           5.2          2.0   virginica
2            6.7          3.1           4.7          1.5  versicolor
3            7.3          2.9           6.3          1.8   virginica
4            4.4          3.0           1.3          0.2      setosa
5            6.6          2.9           4.6          1.3  versicolor
    sepal_length  sepal_width  petal_length  petal_width     species
0            6.9          3.2           5.7          2.3   virginica
1            6.5          3.0           5.2          2.0   virginica
2            6.7          3.1           4.7          1.5  versicolor
3            7.3          2.9           6.3          1.8   virginica
4            4.4          3.0           1.3          0.2      setosa
..           ...          ...           ...          ...         ...
95           5.7          2.8           4.1          1.3  versicolor
96           6.3          2.5           5.0          1.9   virginica
97           5.7          2.8           4.5          1.3  versicolor
98           6.4          2.8           5.6          2.1   virginica
99           5.1          3.7           1.5          0.4      setosa

[100 rows x 5 columns]
     sepal_length  sepal_width  petal_length  petal_width     species
100           4.8          3.0           1.4          0.1      setosa
101           4.9          3.0           1.4          0.2      setosa
102           5.9          3.0           4.2          1.5  versicolor
103           6.9          3.1           5.1          2.3   virginica
104           5.0          2.0           3.5          1.0  versicolor
105           6.4          2.8           5.6          2.2   virginica
106           4.8          3.4           1.9          0.2      setosa
```

Other outputs (problem #2)

```
mean of the first class
 area                      14.321014
perimeter                 14.286377
compactness                0.880201
length_of_kernel           5.504362
width_of_kernel            3.243652
asymmetry_coefficient      2.673872
length_of_kernel_groove    5.085290
dtype: float64

mean of the second class
 area                      18.334286
perimeter                 16.135714
compactness                0.883517
length_of_kernel           6.148029
width_of_kernel            3.677414
asymmetry_coefficient      3.644800
length_of_kernel_groove    6.020600
dtype: float64

mean of the third class
 area                      11.873857
perimeter                 13.247857
compactness                0.849409
length_of_kernel           5.229514
width_of_kernel            2.853771
asymmetry_coefficient      4.788400
length_of_kernel_groove    5.116400
dtype: float64

variance of the first class
 area                      1.486889
perimeter                 0.332894
compactness               0.000265
length_of_kernel          0.053414
width_of_kernel           0.031943
asymmetry_coefficient     1.395337
length_of_kernel_groove   0.070297
dtype: float64

variance of the second class
 area                      2.072149
perimeter                 0.380683
compactness               0.000240
length_of_kernel          0.071926
width_of_kernel           0.034425
asymmetry_coefficient     1.396813
length_of_kernel_groove   0.064482
dtype: float64

variance of the third class
 area                      0.522734
perimeter                 0.115733
compactness               0.000473
length_of_kernel          0.019048
width_of_kernel           0.021761
asymmetry_coefficient     1.786139
length_of_kernel_groove   0.026266
dtype: float64
```

```
    area  perimeter  compactness  ...  asymmetry_coefficient  length_of_kernel_groove  class
0  15.01      14.76       0.8657  ...                  1.791                    5.001      1
1  14.16      14.40       0.8584  ...                  3.072                    5.176      1
2  15.38      14.77       0.8857  ...                  1.999                    5.222      1
3  13.54      13.85       0.8871  ...                  2.587                    5.178      1
4  14.37      14.39       0.8726  ...                  1.464                    5.300      1
5  13.22      13.84       0.8680  ...                  4.157                    5.088      1

[6 rows x 8 columns]
      area  perimeter  compactness  ...  asymmetry_coefficient  length_of_kernel_groove  class
0    15.01      14.76       0.8657  ...                  1.791                    5.001      1
1    14.16      14.40       0.8584  ...                  3.072                    5.176      1
2    15.38      14.77       0.8857  ...                  1.999                    5.222      1
3    13.54      13.85       0.8871  ...                  2.587                    5.178      1
4    14.37      14.39       0.8726  ...                  1.464                    5.300      1
..     ...        ...          ...  ...                    ...                      ...    ...
135  18.65      16.41       0.8698  ...                  4.391                    6.102      2
136  14.99      14.56       0.8883  ...                  2.958                    5.175      1
137  12.88      13.50       0.8879  ...                  2.352                    4.607      1
138  15.38      14.66       0.8990  ...                  3.600                    5.439      2
139  17.98      15.85       0.8993  ...                  2.257                    5.919      2

[140 rows x 8 columns]
      area  perimeter  compactness  ...  asymmetry_coefficient  length_of_kernel_groove  class
140  13.16      13.82       0.8662  ...                 0.8551                    5.056      1
141  12.70      13.41       0.8874  ...                 8.4560                    5.000      3
142  11.87      13.02       0.8795  ...                 3.5970                    5.132      3
143  13.02      13.76       0.8641  ...                 3.3730                    4.825      1
144  12.55      13.57       0.8558  ...                 4.4190                    5.176      3
..     ...        ...          ...  ...                    ...                      ...    ...
204  13.99      13.83       0.9183  ...                 5.2340                    4.781      1
205  10.93      12.80       0.8390  ...                 5.3980                    5.045      3
206  14.70      14.21       0.9153  ...                 1.7670                    4.649      1
207  10.79      12.93       0.8107  ...                 5.4620                    5.194      3
208  18.75      16.18       0.8999  ...                 4.1880                    5.992      2
```