Assignment 4, Data Analysis

Use this dataset
https://archive.ics.uci.edu/dataset/53/iris

1. Calculate the variance and standard deviation of sepal length for each class (Iris Setosa, Iris Versicolour, and Iris Virginica). Are there significant differences in the variability of sepal length among these classes?
2. Determine the probability distribution of petal width for Iris Setosa. Is it a normal distribution, and if not, what kind of distribution does it resemble?=
3. Compute the mode of sepal width for the entire dataset. Does this dataset exhibit a clear mode for sepal width, or is it multimodal?
4. Calculate the mean and standard deviation of petal length for Iris Virginica. How does the mean and standard deviation compare to the same attributes in Iris Setosa and Iris Versicolour?
5. Investigate the median of sepal length for Iris Setosa. How does the median compare to the mean in this case, and what does it suggest about the distribution of sepal length in this class?
6. Determine the interquartile range (IQR) of petal width for each class. Are there any significant differences in the spread of petal width among the three classes?
7. Calculate the mean and standard deviation of sepal length for all instances where sepal width is less than 3 cm. How does this subset of data differ from the dataset as a whole in terms of sepal length?
8. Compute the probability that a randomly selected flower from the dataset belongs to the class Iris Versicolour based on the sepal width being between 2.5 cm and 3.0 cm.
9. For each class, calculate the 10th and 90th percentiles of petal length. What do these percentiles reveal about the range of petal lengths in each class?
10. Investigate the relationship between sepal length and sepal width by calculating the correlation coefficient for each class. Do the classes show different correlations between these two attributes?