## Practice Assignment 12

**Due date:** November 7, 2023

**Topics:**
- Matplotlib
- Numpy
- Pandas

### Instructions

1. Create a bar chart showing the distribution of data from the following array:
   ```python
   import numpy as np
   data = np.random.randint(1, 100, size=100)
   ``
   - Use a title for the chart.
   - Label the x-axis and y-axis.

2. Write a Python function to calculate the mean of a list of numbers.
   ```python
   def calculate_mean(numbers):
       pass
   ``
   - Test the function with a list of numbers.

3. Create a DataFrame using Pandas with the following data:
   ```python
   import pandas as pd
   df = pd.DataFrame({'Name': ['Alice', 'Bob', 'Charlie'], 'Age': [25, 30, 35], 'City': ['New York', 'Los Angeles', 'Chicago']})
   ``
   - Display the DataFrame.
   - Sort the DataFrame by the 'Age' column.

4. Write a Python script to count the number of vowels in a given string.
   ```python
   def count_vowels(text):
       pass
   ``
   - Test the function with different strings.

5. Create a scatter plot using Matplotlib to visualize the relationship between two variables.
   ```python
   import matplotlib.pyplot as plt
   ``
   - Use a different color for the plot points.

6. Write a Python function to calculate the area of a circle given its radius.
   ```python
   import math
   def calculate_circle_area(radius):
       pass
   ``
   - Test the function with different radii.

7. Create a histogram showing the distribution of a dataset.
   ```python
   import seaborn as sns
   ``
   - Use a different style for the histogram bars.

8. Write a Python script to find the median of a list of numbers.
   ```python
   def find_median(numbers):
       pass
   ``
   - Test the function with different input lists.

9. Create a pie chart showing the proportion of different categories in a dataset.
   ```python
   import matplotlib.pyplot as plt
   ``
   - Use a different color for each slice.

10. Write a Python function to calculate the standard deviation of a list of numbers.
    ```python
    def calculate_std_dev(numbers):
        pass
    ``
    - Test the function with different input lists.

11. Create a line chart showing the trend of sales over time.
    ```python
    import pandas as pd
    import matplotlib.pyplot as plt
    ``
    - Use a different line style for the chart.

12. Write a Python script to calculate the maximum and minimum values in a list of numbers.
    ```python
    def find_max_min(numbers):
        pass
    ``
    - Test the function with different input lists.

### Submission

- Save your Python files in a zipped folder and submit to Canvas.
- Include a README file summarizing the steps taken and findings.

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**Note:**
- Use appropriate libraries and functions for creating visualizations.
- Test your functions with different data inputs to ensure accuracy.
- Pay attention to documentation and code formatting.