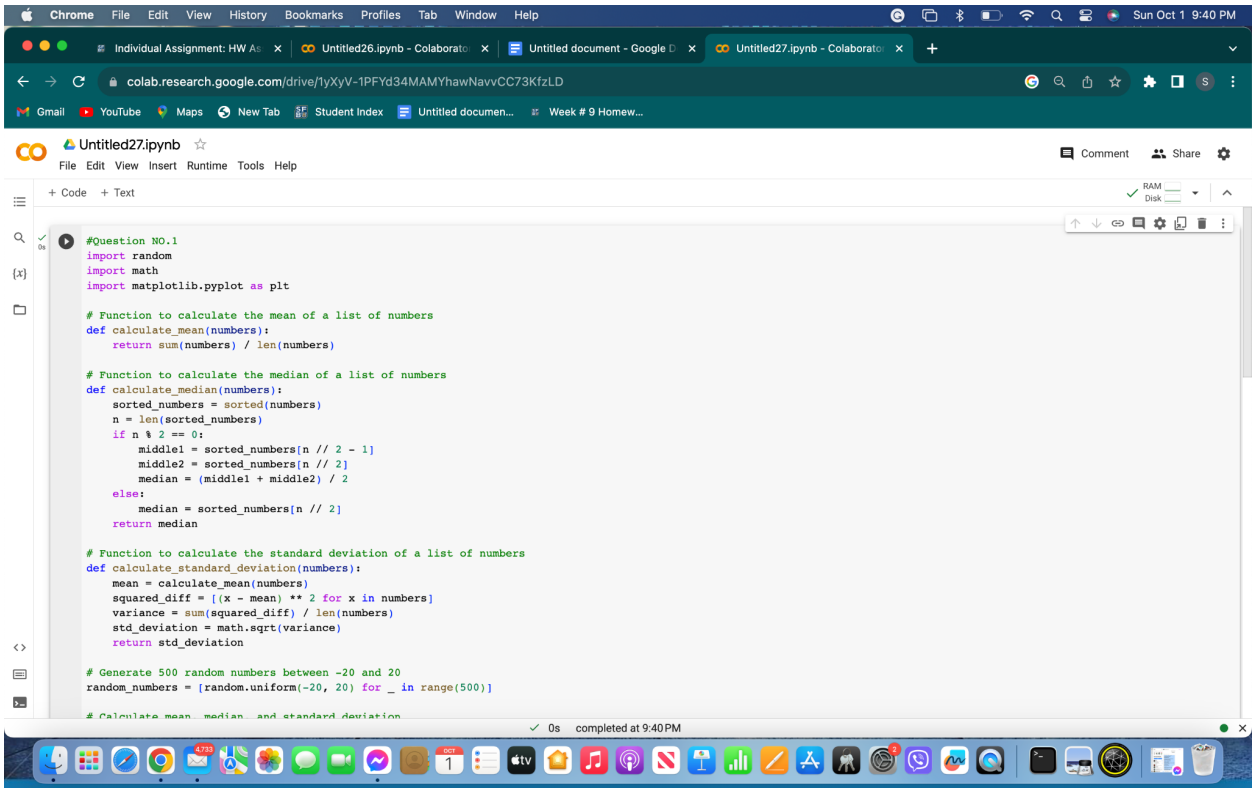
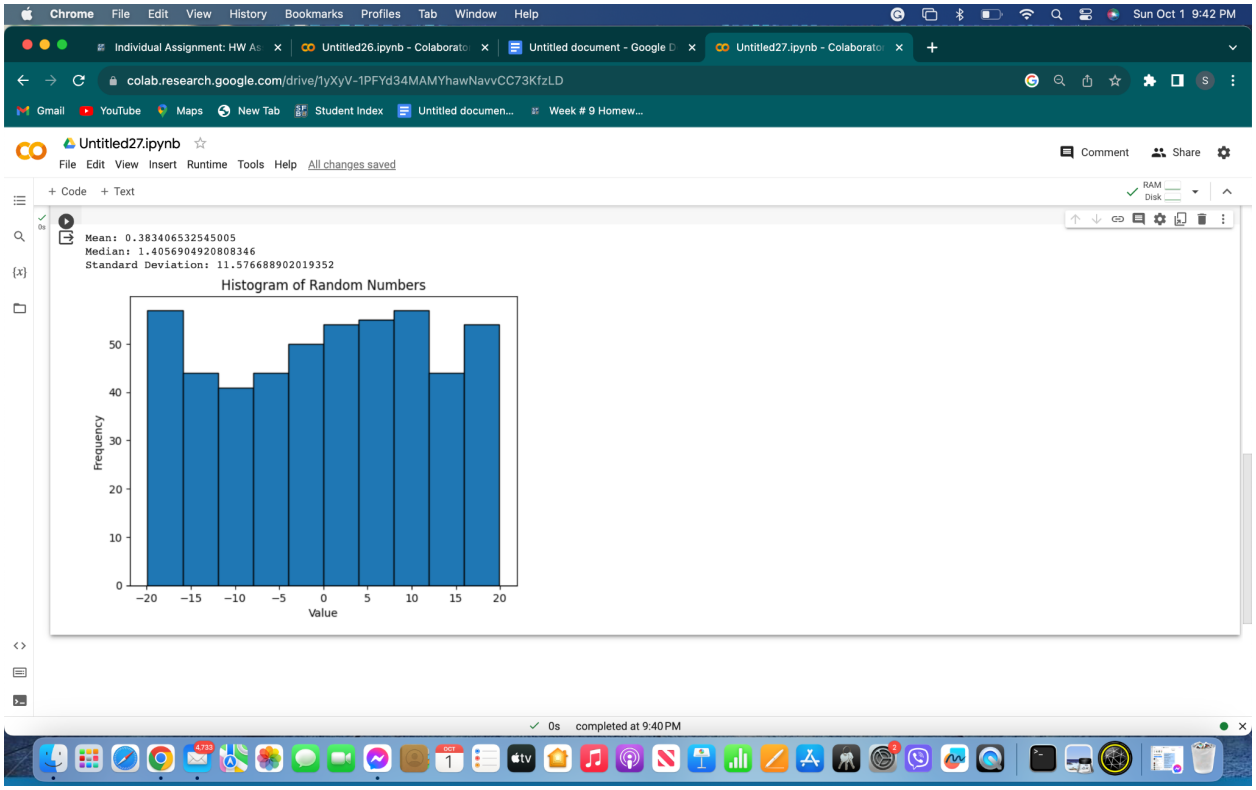
Qno.1 Screenshot:




```python
# Calculate mean, median, and standard deviation
mean = calculate_mean(random_numbers)
median = calculate_median(random_numbers)
std_deviation = calculate_standard_deviation(random_numbers)

# Print the results
print("Mean:", mean)
print("Median:", median)
print("Standard Deviation:", std_deviation)

# Plot a histogram with 10 bins
plt.hist(random_numbers, bins=10, edgecolor='black')
plt.title('Histogram of Random Numbers')
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.show()
```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Mean: 0.383406532545005
Median: 1.4056904920808346
Standard Deviation: 11.576688902019352
Histogram of Random Numbers
Frequency
Value
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Qno.2)

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```
#Question No.2
import random
import math
import matplotlib.pyplot as plt

# Function to calculate the mean of a list of numbers
def calculate_mean(numbers):
    return sum(numbers) / len(numbers)

# Function to calculate the median of a list of numbers
def calculate_median(numbers):
    sorted_numbers = sorted(numbers)
    n = len(sorted_numbers)
    if n % 2 == 0:
        middle1 = sorted_numbers[n // 2 - 1]
        middle2 = sorted_numbers[n // 2]
        median = (middle1 + middle2) / 2
    else:
        median = sorted_numbers[n // 2]
    return median

# Function to calculate the standard deviation of a list of numbers
def calculate_standard_deviation(numbers):
    mean = calculate_mean(numbers)
    squared_diff = [(x - mean) ** 2 for x in numbers]
    variance = sum(squared_diff) / len(numbers)
    std_deviation = math.sqrt(variance)
    return std_deviation

# Generate 500 random numbers with mean = 10 and standard deviation = 0.5
random_numbers = [random.gauss(10, 0.5) for _ in range(500)]

# Calculate mean, median, and standard deviation
```

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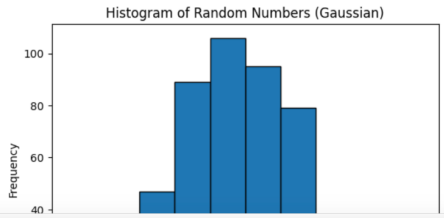
```
mean = calculate_mean(random_numbers)
median = calculate_median(random_numbers)
std_deviation = calculate_standard_deviation(random_numbers)

# Print the results
print("Mean:", mean)
print("Median:", median)
print("Standard Deviation:", std_deviation)

# Plot a histogram with 10 bins
plt.hist(random_numbers, bins=10, edgecolor='black')
plt.title('Histogram of Random Numbers (Gaussian)')
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.show()
```

```
Mean: 9.972458828633027
Median: 9.968893973032479
Standard Deviation: 0.4934791743755712
```



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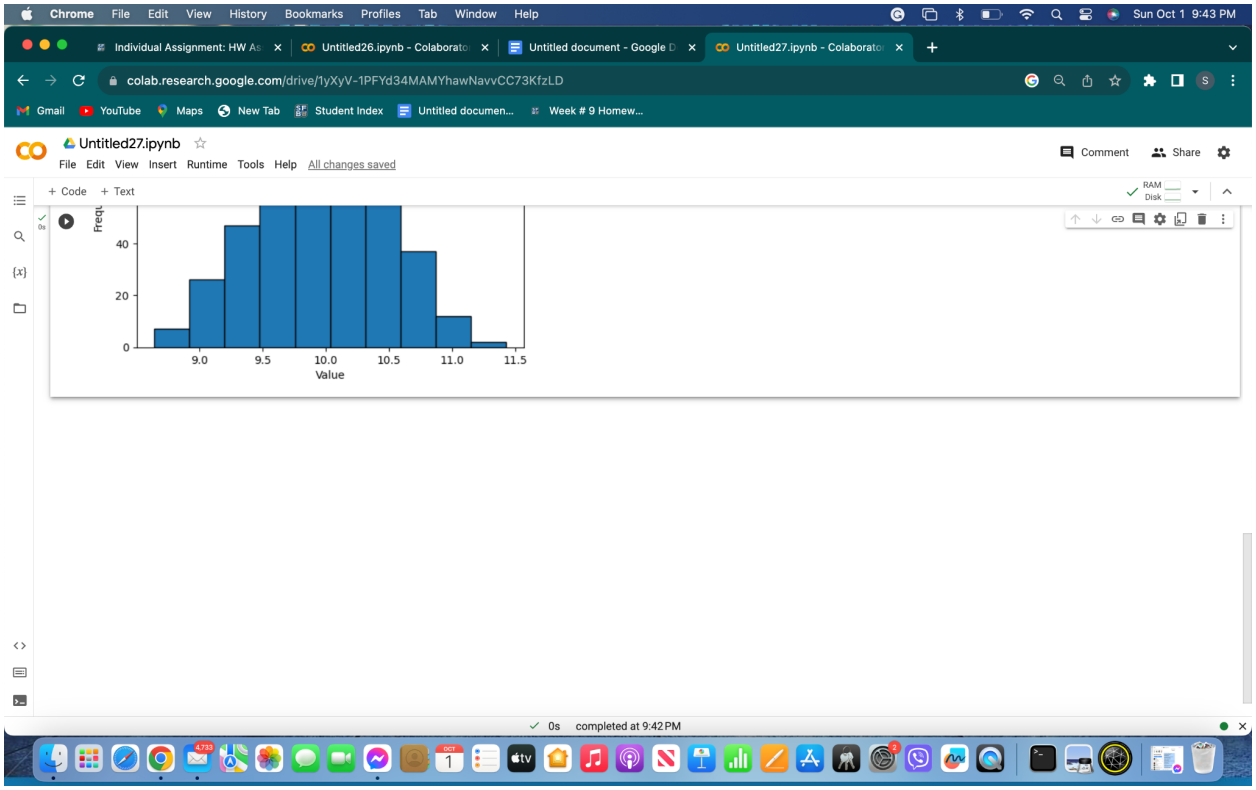
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9.0
9.5
10.0
10.5
11.0
11.5
Value
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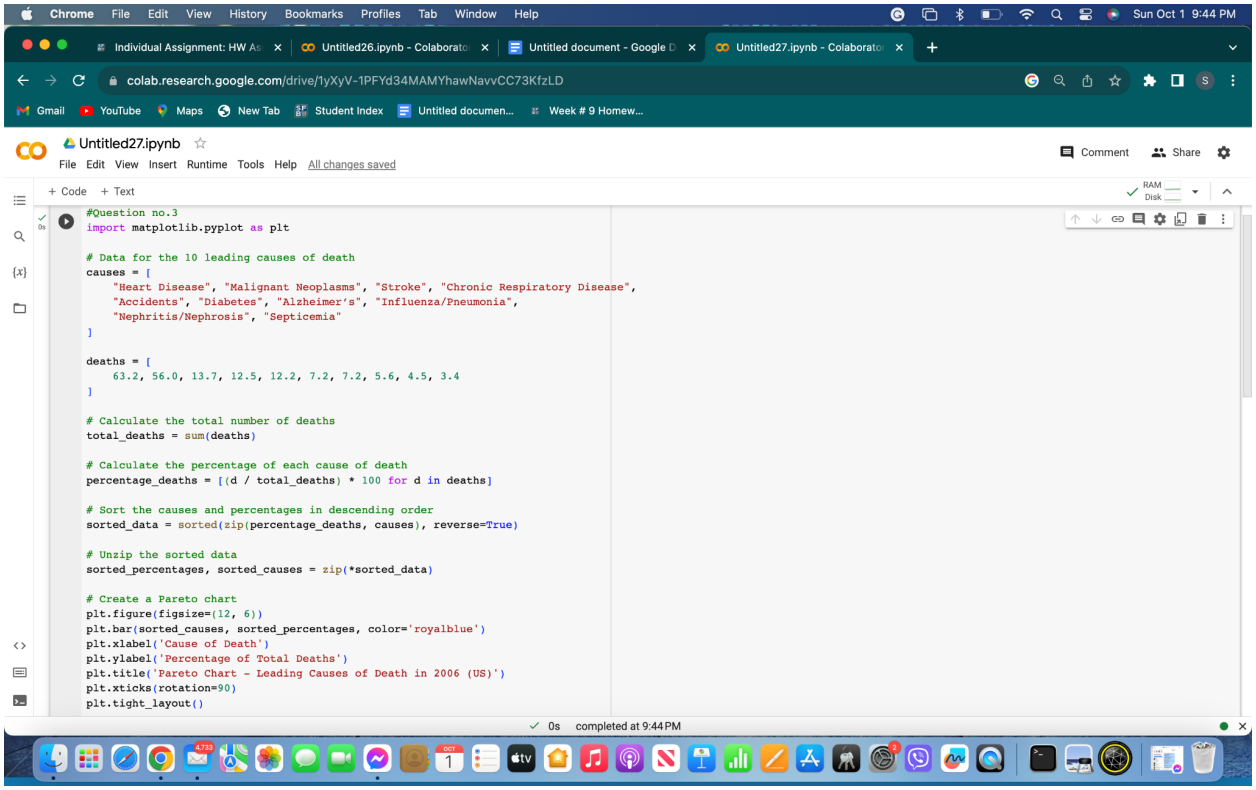
Qno.3)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#Question no.3
import matplotlib.pyplot as plt
# Data for the 10 leading causes of death
causes = [
"Heart Disease", "Malignant Neoplasms", "Stroke", "Chronic Respiratory Disease",
"Accidents", "Diabetes", "Alzheimer's", "Influenza/Pneumonia",
"Nephritis/Nephrosis", "Septicemia"
]
deaths = [
63.2, 56.0, 13.7, 12.5, 12.2, 7.2, 7.2, 5.6, 4.5, 3.4
]
# Calculate the total number of deaths
total_deaths = sum(deaths)
# Calculate the percentage of each cause of death
percentage_deaths = [(d / total_deaths) * 100 for d in deaths]
# Sort the causes and percentages in descending order
sorted_data = sorted(zip(percentage_deaths, causes), reverse=True)
# Unzip the sorted data
sorted_percentages, sorted_causes = zip(*sorted_data)
# Create a Pareto chart
plt.figure(figsize=(12, 6))
plt.bar(sorted_causes, sorted_percentages, color='royalblue')
plt.xlabel('Cause of Death')
plt.ylabel('Percentage of Total Deaths')
plt.title('Pareto Chart - Leading Causes of Death in 2006 (US)')
plt.xticks(rotation=90)
plt.tight_layout()
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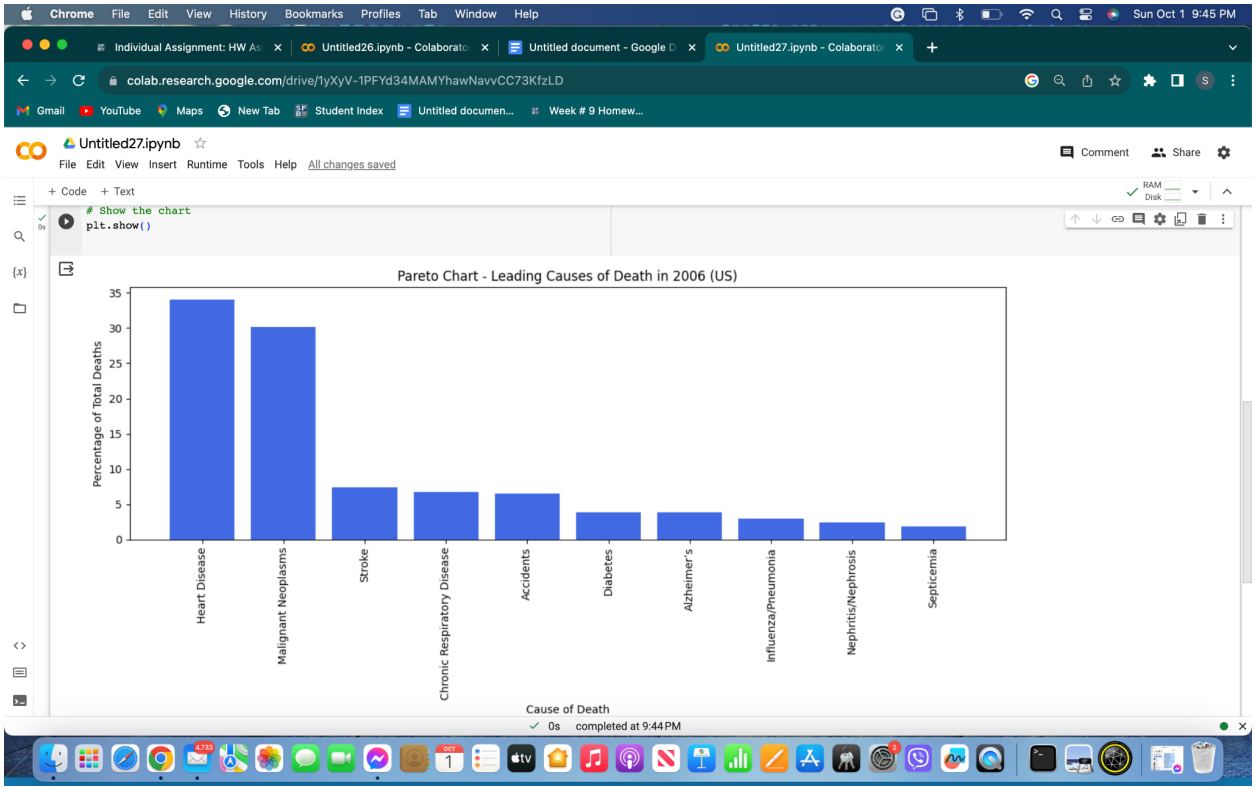
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# Show the chart
plt.show()
Pareto Chart - Leading Causes of Death in 2006 (US)
Percentage of Total Deaths
0 5 10 15 20 25 30 35
Heart Disease
Malignant Neoplasms
Stroke
Chronic Respiratory Disease
Accidents
Diabetes
Alzheimer's
Influenza/Pneumonia
Nephritis/Nephrosis
Septicemia
Cause of Death
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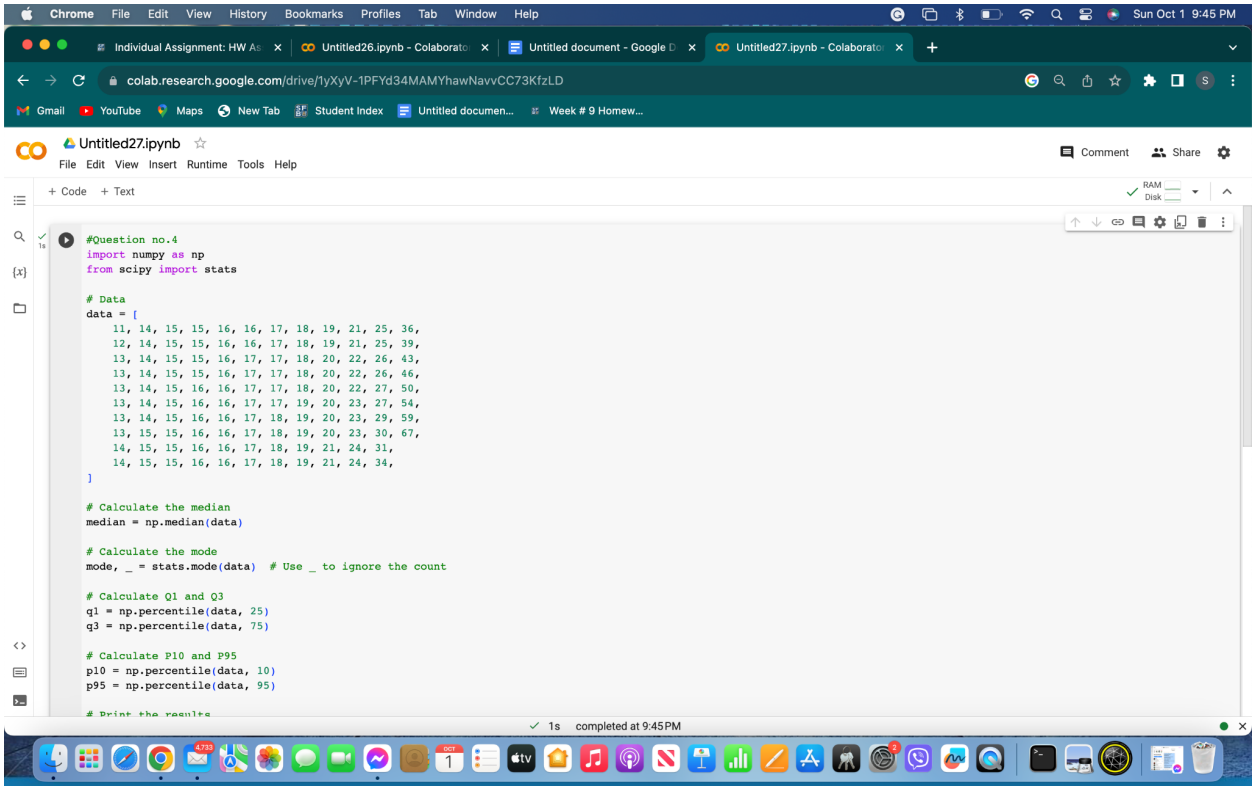
Qno.4)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#Question no.4
import numpy as np
from scipy import stats
# Data
data = [
11, 14, 15, 15, 16, 16, 17, 18, 19, 21, 25, 36,
12, 14, 15, 15, 16, 16, 17, 18, 19, 21, 25, 39,
13, 14, 15, 15, 16, 17, 17, 18, 20, 22, 26, 43,
13, 14, 15, 15, 16, 17, 17, 18, 20, 22, 26, 46,
13, 14, 15, 16, 16, 17, 17, 18, 20, 22, 27, 50,
13, 14, 15, 16, 16, 17, 17, 19, 20, 23, 27, 54,
13, 14, 15, 16, 16, 17, 18, 19, 20, 23, 29, 59,
13, 15, 15, 16, 16, 17, 18, 19, 20, 23, 30, 67,
14, 15, 15, 16, 16, 17, 18, 19, 21, 24, 31,
14, 15, 15, 16, 16, 17, 18, 19, 21, 24, 34,
]
# Calculate the median
median = np.median(data)
# Calculate the mode
mode, _ = stats.mode(data) # Use _ to ignore the count
# Calculate Q1 and Q3
q1 = np.percentile(data, 25)
q3 = np.percentile(data, 75)
# Calculate P10 and P95
p10 = np.percentile(data, 10)
p95 = np.percentile(data, 95)
# Print the results
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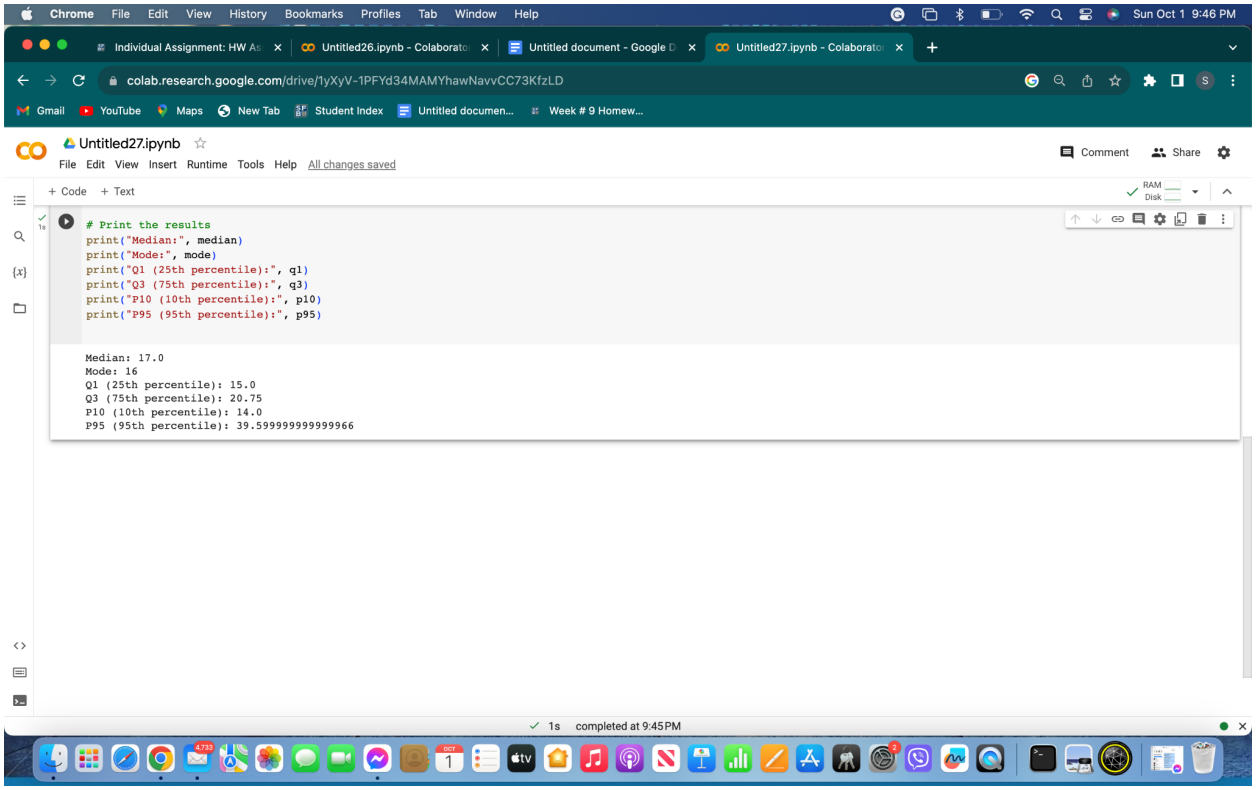
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# Print the results
print("Median:", median)
print("Mode:", mode)
print("Q1 (25th percentile):", q1)
print("Q3 (75th percentile):", q3)
print("P10 (10th percentile):", p10)
print("P95 (95th percentile):", p95)
Median: 17.0
Mode: 16
Q1 (25th percentile): 15.0
Q3 (75th percentile): 20.75
P10 (10th percentile): 14.0
P95 (95th percentile): 39.599999999999966
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THANK YOU.