**Principles of Data Science Assignment-3 and 4**

**Report**

Name: Shiva Reddy Dubbaka

Id: 16352875

Q2:

**a) Comparison of Glucose Statistics (Sample vs Population)**

The bar graph comparing glucose levels in a sample and a population. The y-axis displays glucose readings, while the x-axis displays the two groups being compared, "Sample" and "Population".   
  
The population has a higher mean glucose level than the sample. Furthermore, the highest glucose level in the sample is lower than the maximum glucose level in the population.

The image you supplied is a bar graph comparing glucose levels in a sample and a population. The y-axis displays glucose readings, while the x-axis displays the two groups being compared, "Sample" and "Population".   
  
The population has a higher mean glucose level than the sample. Furthermore, the highest glucose level in the sample is lower than the maximum glucose level in the population.

**A graph showing a comparison of glucose

Description automatically generated**

**b) Compare 98th percentile BMI between sample and population.**   
  
The graph compares the 98th percentile Body Mass Index (BMI) of a sample with a population. The y-axis displays the BMI values, while the x-axis depicts the two groups being compared, "Sample" and "Population".   
  
The sample's 98th percentile BMI exceeds the population's 98th percentile. This signifies that 2% of the sample has a BMI higher than the number on the y-axis, whereas 2% of the population has a BMI lower than the value on the y-axis.

A graph of a comparison of bmi

Description automatically generated

**c) Comparing Blood Pressure Statistics (Bootstrap Samples versus Population) Mean Blood Pressure:**   
  
A comparison of mean blood pressure in a population against bootstrap samples. The x-axis displays the blood pressure (mean), while the y-axis displays the frequency.   
  
The population mean appears to be much lower than the bootstrap samples' average blood pressure. This shows that the bootstrap samples might not be representative of the population.   
  
The bootstrap samples may be too tiny. Bootstrap sampling is a technique for estimating the distribution of a statistic (such as the mean) by resampling a dataset using replacement. If the bootstrap samples are too tiny, they may not adequately reflect the population's variability.   
The data may not be regularly distributed.

"Comparison of Standard Deviation Blood Pressure”. The x-axis displays the blood pressure standard deviation, while the y-axis displays the frequency. The graph compares the standard deviation of blood pressure in a population with that of bootstrap samples.   
  
The graph illustrates that the population has a higher standard deviation of blood pressure (14%) than the bootstrap samples do. The bootstrap samples have a larger range of standard deviation than the population. This suggests that blood pressure in the general population is more constant than in bootstrap samples.

A comparison of blood pressure and blood pressure

Description automatically generated

"Comparison of Blood Pressure (75th Percentile)" . The x-axis displays the blood pressure, while the y-axis displays the frequency. The graph compares the 75th percentile of blood pressure in a population with bootstrap samples.   
  
The 75th percentile of blood pressure in the general population appears to be lower than the bootstrap samples' 75th percentile. This suggests that 75% of the population has a lower blood pressure than the y-axis value, whereas 75% of the bootstrap samples have a higher blood pressure.

A graph with red lines

Description automatically generated