

Assignment Number 1

Note: When solving the assignment do it step by step and use proper English to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

31 38 36 31 33 35 32 35 30 32 38 33 37 31 39 37 39 30 34 38 31 30 30 39 35 35 37 39 36 30 35 38 39 38 35 33 38 36 36 33 33 35 31 30 30 37 32 30 30 33

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 79 and a standard deviation of 4. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

10 31 14 48

(l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation

Assignment Number 2

Note: When solving the assignment do it step by step and use proper English to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

22 29 23 25 23 23 25 22 20 22 20 20 27 26 25 29 23 23 20 20 26 27 22 21 26 27 22 22 28 28 25 20 22 21 28
25 20 29 25 22 27 21 25 21 25 20 21 20 29 27

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 53 and a standard deviation of 5. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

30 26 26 27

- (l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 3

Note: When solving the assignment do it step by step and use proper english to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

42 46 44 41 43 44 46 43 43 46 44 49 48 47 48 48 40 45 49 42 40 48 42 45 49 47 42 42 47 42 44 47 49 42 49 40 41 46 45 44 46 41 43 42 43 40 46 44 43 45

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 91 and a standard deviation of 6. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

6 4 32 41

- (l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 4

Note: When solving the assignment do it step by step and use proper english to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

24 27 24 27 21 27 26 24 28 29 20 26 25 28 25 23 20 29 29 25 20 29 23 28 24 28 27 27 25 22 21 20 25 22 27 25 29 25 20 23 27 20 20 27 21 24 28 24 24 28

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 54 and a standard deviation of 8. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

33 33 40 6

(l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 5

Note: When solving the assignment do it step by step and use proper english to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

22 29 29 29 20 25 29 22 22 23 25 29 20 25 25 25 29 22 25 23 26 24 26 21 21 23 20 21 25 25 25 25 25 22 22 25 29 28 22 22 24 22 26 20 22 25 27 26 23 24

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 59 and a standard deviation of 3. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

27 23 47 37

- (l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 6

Note: When solving the assignment do it step by step and use proper english to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

34 36 30 37 30 39 33 39 35 39 34 34 35 31 35 37 31 36 31 35 37 31 31 35 38 32 33 33 32 37 37 39 34 32 31 30 33 33 39 36 38 34 37 39 38 33 32 31 33 39

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 68 and a standard deviation of 8. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

40 1 43 11

(l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 7

Note: When solving the assignment do it step by step and use proper english to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

14 17 11 18 13 16 19 17 12 15 18 16 11 18 17 19 12 17 18 17 13 16 16 19 10 15 19 17 17 15 13 18 16 18 13 11 10 12 11 19 10 12 13 16 17 18 12 13 19 13

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 35 and a standard deviation of 2. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

43 33 30 1

- (l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 8

Note: When solving the assignment do it step by step and use proper English to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

14 18 13 13 18 13 13 12 12 15 10 18 12 14 15 18 19 15 14 11 18 15 14 11 14 18 13 17 17 11 11 19 19 15 14 10 15 14 10 19 13 19 14 17 18 11 18 12 14 19

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 28 and a standard deviation of 9. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

28 2 35 33

- (l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.

Assignment Number 9

Note: When solving the assignment do it step by step and use proper English to explain each step so that you can be properly rewarded. A better explanation carries better marks.

SAMPLE DATA 1

21 24 22 22 24 20 20 20 29 25 22 27 24 23 24 26 26 29 29 22 25 20 24 29 26 27 28 20 26 27 28 27 27 26 22 23 29 21 23 28 29 20 28 27 20 22 28 27 24 26

Given the above sample data 1 do the following:

- (a) Create an appropriate frequency distribution containing 5 classes.
- (a) Create a relative frequency distribution of the above frequency distribution.
- (c) Create a cumulative frequency distribution of the above frequency distribution.
- (c) Make an argument whether it is a normal distribution or not or what kind of distribution it is and why.
- (d) Find the mean of the frequency distribution.
- (e) Find the variance and standard deviation of the sample data.
- (f) Check if 95% of the sample data lies within 2 standard deviations. Give arguments if it holds or if it does not hold. Use Chebyshev's theorem and show that it works/holds for $K=2$ on your dataset.

SAMPLE DATA 2

Generate 50 data points (normally distributed) using the website

<https://www.socscistatistics.com/utilities/normaldistribution/default.aspx> with population mean 45 and a standard deviation of 5. Write the data on the answer sheet.

- (g) Use the range rule of thumb to find the limits separating values that are significantly low or significantly high. Show if the range rule of thumb for normal distribution holds for 2 standard deviations.
- (h) Calculate and show which of the above sample data 1 or sample data 2 varies more than the other.
- (i) Pick up the first two data points from the second dataset and show which of values is a more extreme value in the dataset and why.
- (j) Pick up the last data point in the second dataset and tell whether the value is significantly low / significantly high / usual.
- (k) Draw a boxplot for the first data set that also shows the range for outliers.

Suppose that your population consists only of these 4 numbers:

Population:

48 9 43 16

- (l) Generate all possible samples of size 2 from your population with replacement (note that 5,6 and 6,5 are two different samples and 5,5 is also a sample)

Then prove the following by showing all calculations:

- (m) Sample mean is an unbiased estimator of the population mean.
- (n) Sample variance is an unbiased estimator of the population variance.
- (o) Sample standard deviation is a biased estimator of the population standard deviation.