

Assignment 01

1. Each member of an athletics club was asked to monitor the distance run in training during a particular week. The table below summarizes the results.

Distance to nearest Km	30-40	40-50	50-60	60-70	70-80	80-90
Number of athletes'	2	4	7	12	9	6

- (i). Identify the modal and median class.
- (ii). Estimate the standard deviation of this population of athletes.

2. Consider the frequency distribution of CGPA of the UIU students given below.

CGPA	1 – 1.5	1.5 – 2	2 – 2.5	2.5 – 3	3 – 3.5	3.5 – 4
Frequency	4	18	a	23	9	5
Cumulative frequency	4	22	53	b	85	90

- (i). Find the values of a & b and the sample size.
- (ii). Sketch the cumulative frequency polygon.
- (iii). From the sketched graph find the approximate number of students attained CGPA less than 1.75 and more than 3.25.
- (iv). Graphically find the position (in CGPA) of 35% and 65% students.
- (v). Find the geometric mean of the given distribution.

3. Consider the frequency distribution table given below for the followings.

Class	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	a	14	11	10	6
Cumulative frequency	9	23	34	b	50

- (i). Find the values of a and b to complete the frequency distribution table.
- (ii). Sketch the cumulative frequency polygon of the distribution and hence find the median.
- (iii). Find the mean deviation from the median.
- (iv). Find the percentage of weights between 20 and 40?
- (v). Find the sample size and range of the distribution.

4. If the mode of the following frequency table is 2.34, find the unknown frequency. Hence, find the statistical index (standardized value) of $x = 2.75$.

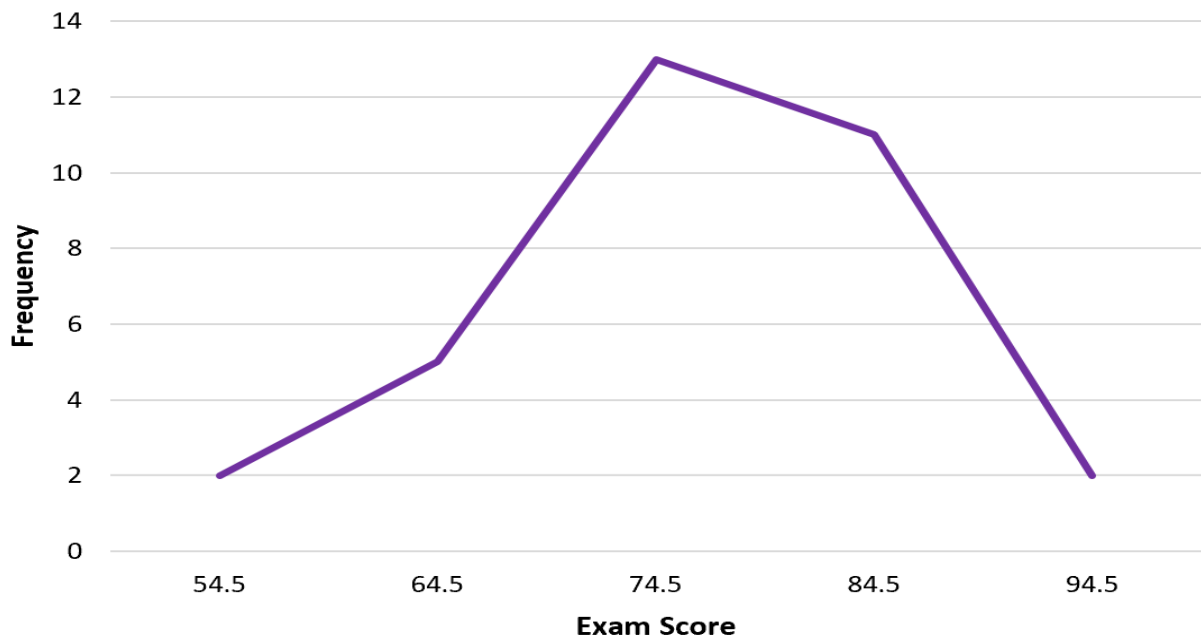
CGPA	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5	3.5-4
No of students	7	18	35	?	10	3

Assignment 01

5. The following table shows the results of a survey to find the average daily time, in minutes, that a group of children spent in internet chat rooms, where the mean time was estimated to be 27.5 minutes. From an equation involving f and hence show that the total number of children in the survey was 26.

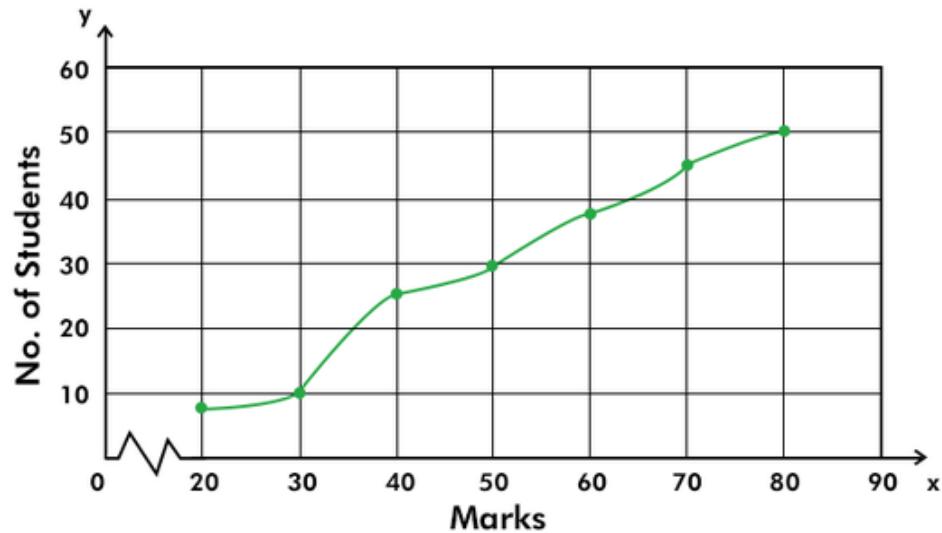
Time per day	0-10	10-20	20-40	40-80
No of children	2	f	11	4

6. A summary of 24 observations of x is given as the sums $\sum f_i(x_i - a) = -73.2$ and $\sum f_i(x_i - a)^2 = 2215$, where the mean of these observations is 8.95.
- Find the value of the constant a .
 - Find the standard deviation of x .
7. Let the class marks of a certain population table are 17, 22, 27, 32, and 37 and the corresponding frequencies are 9, 13, 8, 10, and 15.
- Determine size of the classes and hence construct the original classes.
 - Find the median class and hence find the percentage of the frequency of that class.
 - Find the sample size.
8. From the following frequency polygon construct the corresponding frequency table and hence sketch the pie chart.

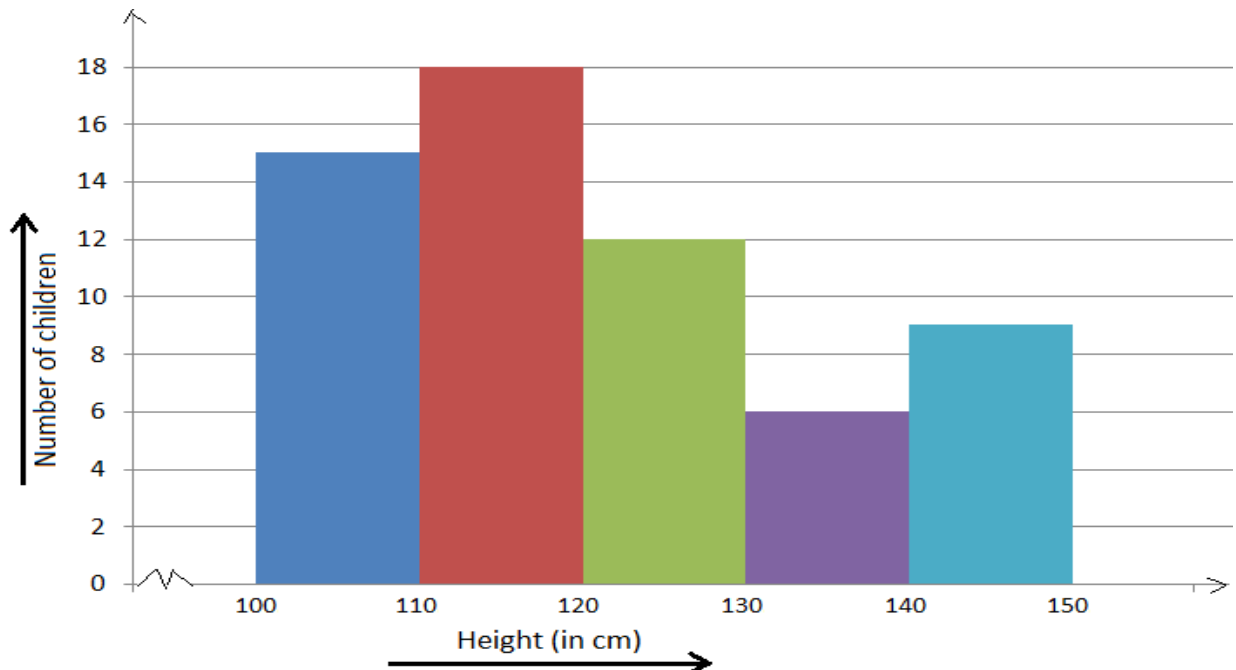


Assignment 01

9. Consider the cumulative frequency polygon representing the distribution of the marks attained by 50 students a qualifying examination.



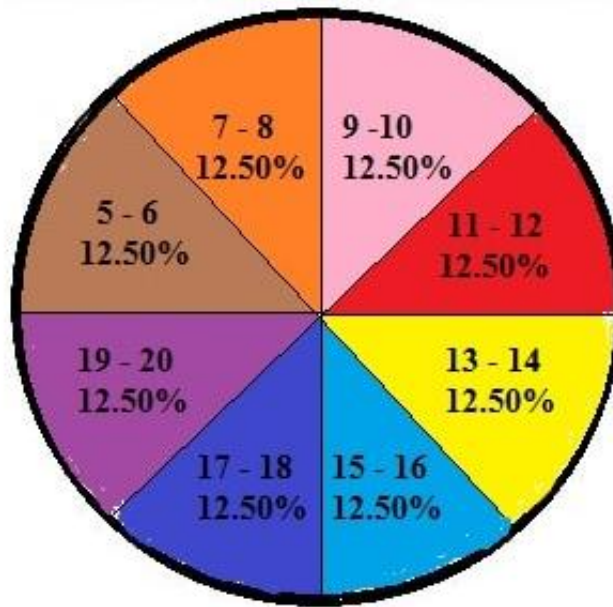
- Construct the frequency distribution table.
 - Find the median of the marks.
 - Find the percentage of the students attained more than 70.
 - Find the percentage of the students attained less than 60.
 - Find inter-quartile range of the marks.
10. The frequency distribution table of height of some children is given below.



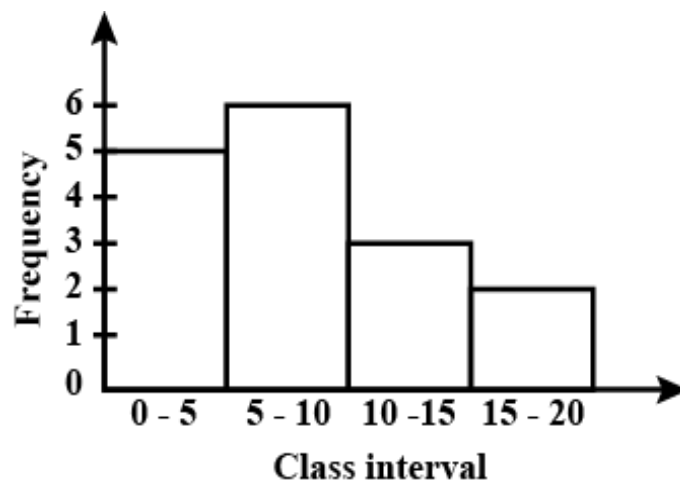
Assignment 01

- (i). Find the mode.
- (ii). Construct the frequency distribution table and hence find the harmonic mean.
- (iii). Find the standard deviation of the frequency distribution.
- (iv). Sketch the cumulative frequency polygon and hence estimate D_3 and P_{60} .
- (v). Find the percentage of children have height between 110 cm and 130 cm?

11. Consider the total 200 students with the age ranges as follows. Construct the corresponding frequency distribution table.

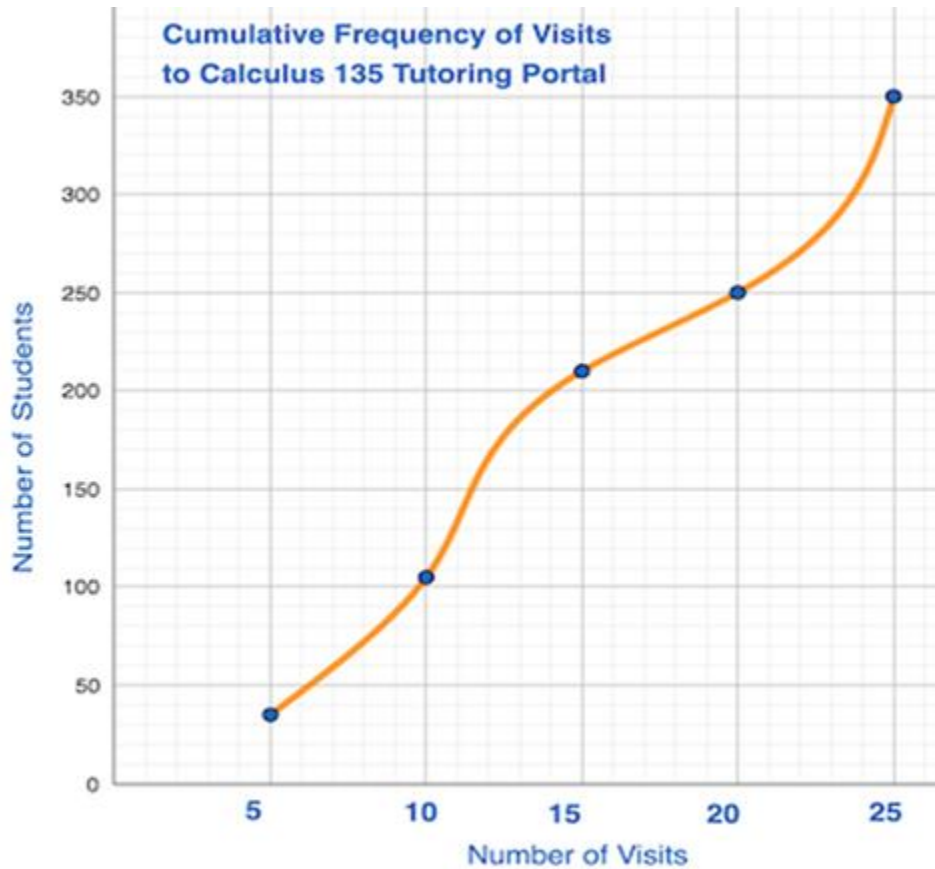


12. According to following histogram find the mode. Also, assuming proper classes find the mean deviation from the mode. [4]



Assignment 01

13. The cumulative distribution polygon of visits of calculus tutorial portal is given below.



- Construct the frequency distribution table and hence find the geometric mean.
- Find the median of visits from the graph.
- Find the standard deviation of the frequency distribution.
- Find the inter-quartile range from the graph.
- Sketch the histogram and hence the mode of the visits.
- Find the percentage of visits between 7 to 21 visits?

14. Consider the following data that represent the height and weight of the students in an institution.

Height	62, 66, 57, 64, 59, 68, 69, 56, 70, 63, 71, 55, 60
Weight	73, 65, 61, 75, 61, 56, 57, 69, 58, 66, 77, 60, 59, 53

- Design a back-to-back Stem-Leaf diagram.
- Sketch the Box-Whisker plot of the Stem-Leaf diagram found in (i).
- Investigate the nature (skewness) of the height and weight.

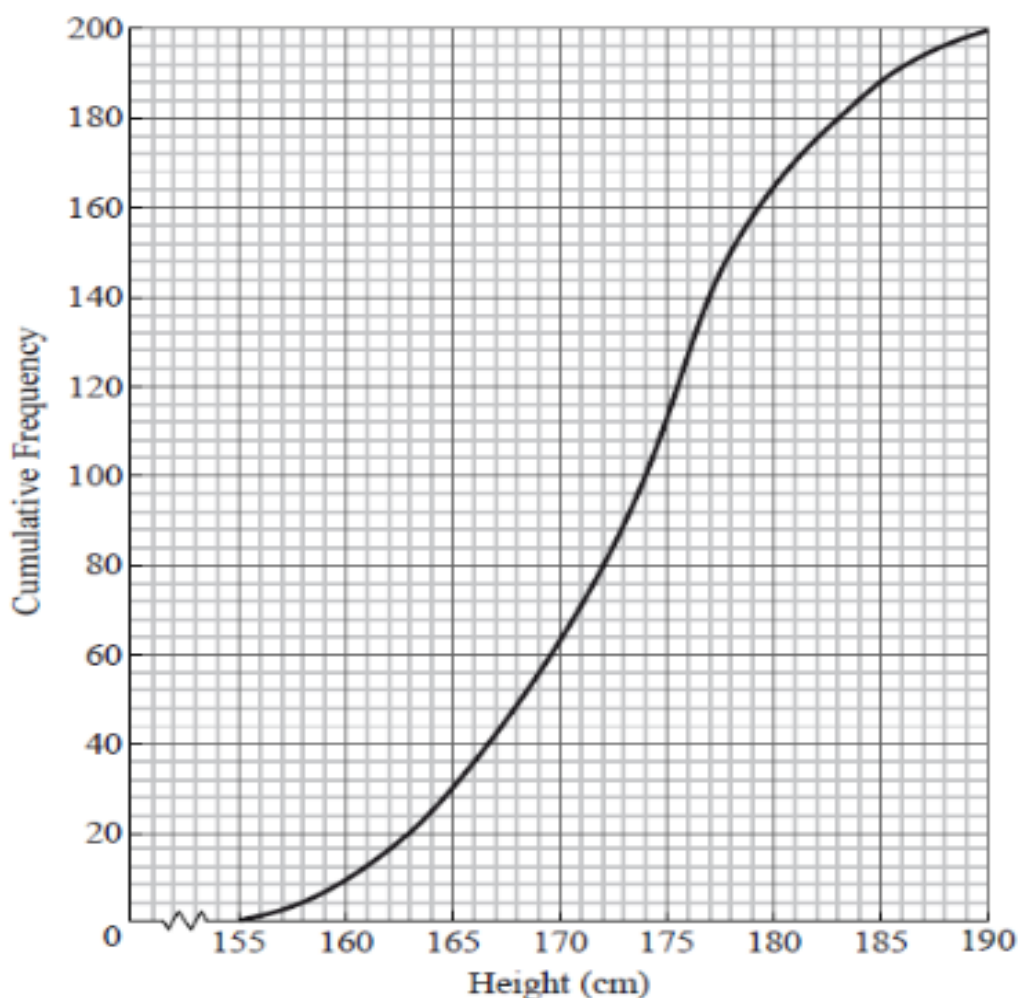
Assignment 01

15. Consider the following data that represent the CGPAs obtained by the boys and girls.

Boys	3.6, 2.2, 4.0, 2.9, 1.7, 0.1, 2.6, 3.3, 3.4, 3.7, 2.1, 1.8, 1.5, 1.6, 2.9, 3.7, 3.8, 2.2, 2.5, 2.8, 2.0
Girls	2.5, 2.7, 3.2, 1.7, 1.9, 2.4, 2.8, 3.2, 3.7, 3.2, 1.8, 2.6, 2.3, 1.8, 1.6, 3.6, 2.1, 2.9, 3.1, 2.0

- (i). Design a back-to-back Stem-Leaf diagram.
- (ii). Find the ranges of the CGPAs of the boys and girls.
- (iii). Which group doing better results?
- (iv). Describe the consistency of the CGPAs obtained by the boys and girls.
- (v). Sketch the Box-Whisker plot of the Stem-Leaf diagram found in (i).
- (vi). Are there any outliers of the CGPAs?
- (vii). Justify the skewness of the obtained CGPAs.
- (viii). Find the modal stems and modes of the obtained CGPAs.

16. The cumulative frequency graph illustrates the height of 200 students in a community.



Assignment 01

- (i). State the range of the data.
- (ii). Construct a box and whisker plot to illustrate the data.
- (iii). What percentage of students has their height more than 170 cm?
- (iv). Find the outlier if there exists any.

17. Consider the following frequency distribution of CGPA of 100 UIU students.

CGPA	1-1.5	1.5-2	2-2.5	2.5-3	3-3.5	3.5-4
No of students	7	18	35	27	10	3

- (i). Find first four raw moments about $A = 1.75$ and convert them to the central moments.
- (ii). Find the co-efficient of skewness and co-efficient of kurtosis.
- (iii). Comment on your findings.

18. Construct a regression line of x on y . Also, from the graph of the regression line predict x for $y = 21$.

x	22	18	26	29	19
y	13	17	14	11	16

19. If the correlation coefficient of two variables is 0.65 and regression coefficient of y on x is 1.68. Also, $\bar{x} = 32.3$ and $\bar{y} = 45.6$.

- (i). Find the regression coefficient of x on y .
- (ii). Find and sketch the regression line x on y .
- (iii). Predict the value of x when y is 52. Also, verify your result graphically.

20. If the correlation coefficient of x & y is 0.75 and the corresponding standard deviations 1.25 & 1.75. Find the regression coefficient of y on x and x on y .

21. Discuss and manifest the strength of correlation from the following correlation coefficient.

- (i) $r = -0.15$ (ii) $r = -1$ (iii) $r = 0.65$ (iv) $r = 1$ (v) $r = 0$

22. Consider the regression coefficients $b_{y/x} = 0.27$ and $b_{x/y} = 2.41$ to find the r_{xy} ?

23. Consider $\sum x = 360$, $\sum x^2 = 9802$, $\sum y = 345$, $\sum y^2 = 8469$, and $\sum xy = 8238$ for 15 observations of x and y .

- (i). Find the coefficients $b_{\frac{y}{x}}$ and $b_{\frac{x}{y}}$ and hence estimate r_{xy} .
- (ii). Find and sketch the regression line of x on y .
- (iii). Graphically determine x for $y = 25$.

Assignment 01

24. Find the rank correlation co-efficient between obtained places of 8 students in to programming contests.

Mathematics	3	1	6	5	7	4	8	2
Physics	8	3	1	2	6	5	4	7

25. For the following table find the rank correlation between the provided groups.

Group	Rank				
A	3	1	4	5	2
B	5	3	1	2	4