Assignment Mid Recovery 01

1. 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

   (a). Sketch histogram and frequency polygon of the frequency distribution in the same graph. Also, sketch the pie chart.
   (b). Sketch histogram and find the mode from it. Check your result.
   (c). Draw the cumulative frequency curve (OGIVE) and find median, 3rd quartile, 7th Decile, and 55th Percentile from the OGIVE. Also, verify by the analytical method.
   (d). Find arithmetic mean and standard deviation of the frequency distribution.
   (e). Find the statistical index for the value $x = 2.6$.
   (f). Estimate median and then mean deviation from median. Also, find the coefficient of the mean deviation.
   (g). Find first four raw moments about $A = 1.75$ and convert them to the central moments.

2. 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

   (a). Find the cumulative frequency polygon.
   (b). Estimate Q_1, Me, D_6, and P_{85} from the cumulative frequency polygon.
   (c). Estimate the mean distance and the standard deviation of the distribution.
   (d). Find the interquartile range of the given distribution.

3. The frequency distribution table of CGPA of the some UIU students is 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	25	9	5
Cumulative frequency	4	22	51	b	85	90

   (a). Find the values of a & b to complete the frequency distribution table.
   (b). Find the median class and hence find the percentage of the frequency of that class.

4. 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

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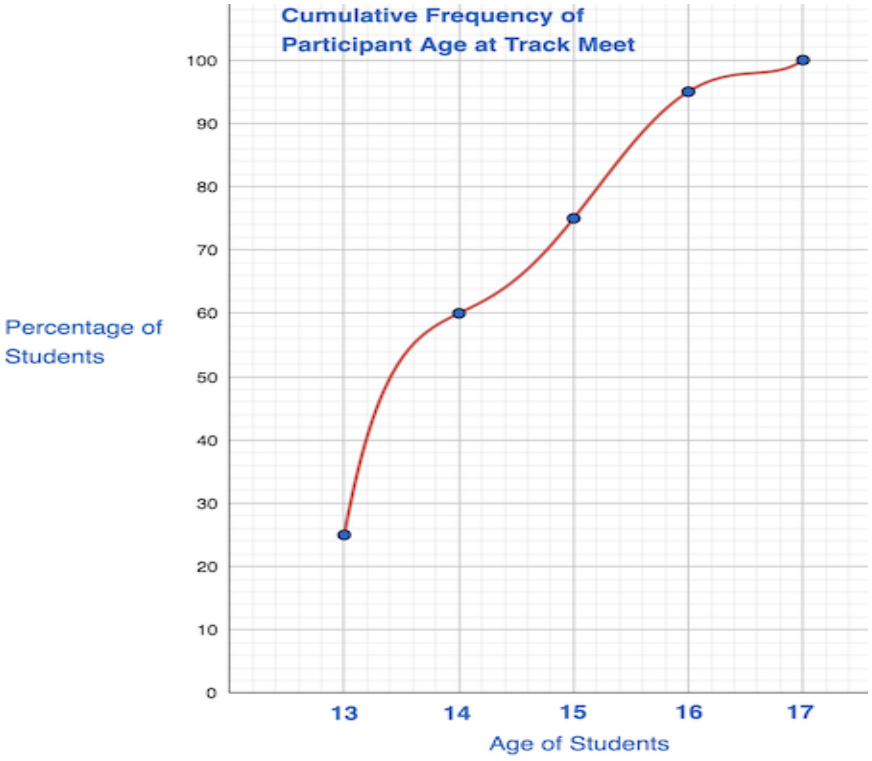
5. If the mode of the following frequency table is 2.34, find the unknown frequency f. Hence, find the statistical index (standardized value) of $x = 2.75$.

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	f	10	3

6. From the following frequency polygon construct the corresponding frequency table and hence find the standardized value for $x = 60$.

7. From the following cumulative frequency polygon construct the corresponding frequency table and hence find the geometric and harmonic mean of the distribution.



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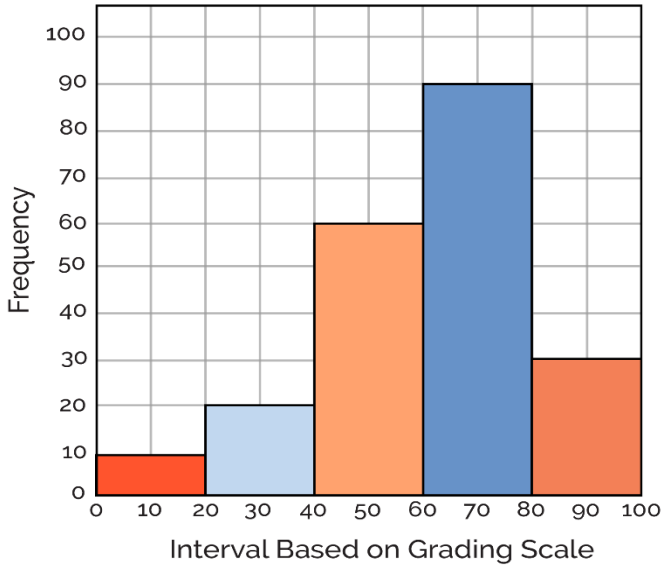
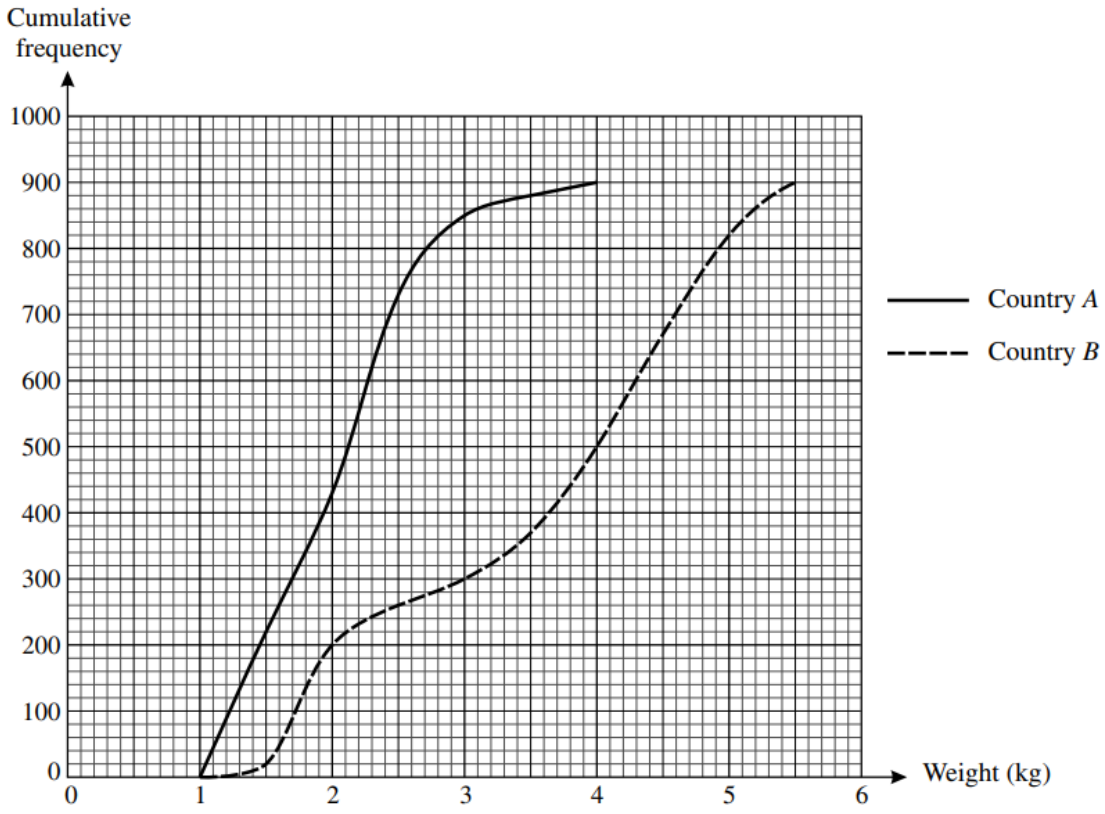
8. From the following histogram construct the corresponding frequency table. Find the median and corresponding mean deviation of the distribution.



9. The birth weights of random samples of 900 babies born in country *A* and 900 babies born in country *B* are illustrated in the cumulative frequency graphs. Use suitable data from these graphs to compare the central tendency and spread of the birth weights of the two sets of babies.



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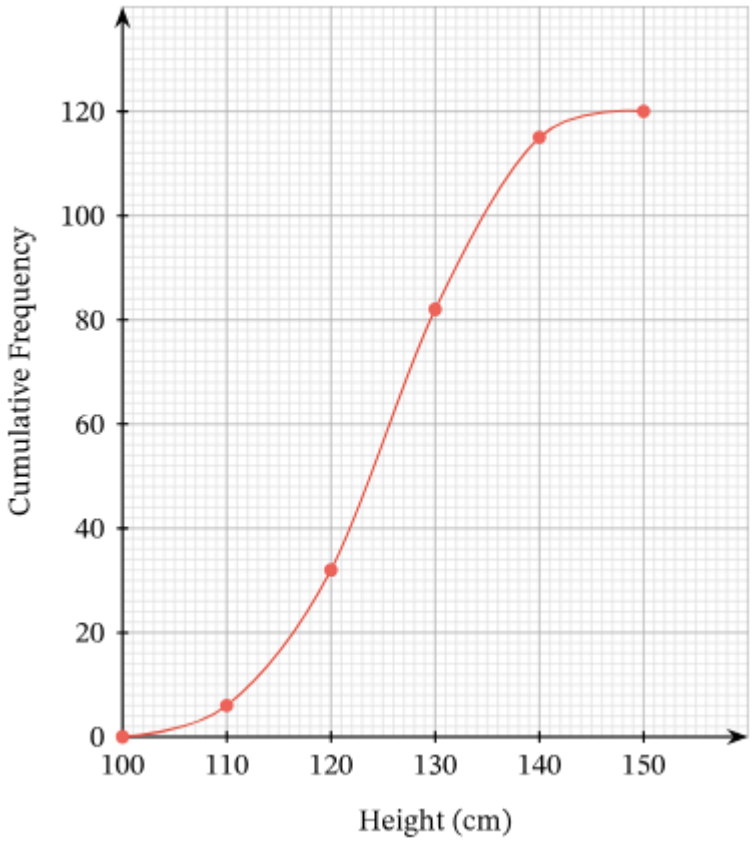
10. The cumulative frequency graph illustrates the height of 120 habitants in an area.



(a). State the range of the data.
(b). Construct a box and whisker plot to illustrate the data.
(c). What percentage of students have height more than 170 cm?
(d). Find the position of the height of 40^{th} percentile and 70^{th} percentile.
(e). Find the outlier if there exits any.

11. 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.

(a). Determine size of the classes and hence construct the original classes.
(b). Find the median class and hence find the percentage of the frequency of that class.
(c). Find the sample size.

12. There are three groups of people have average earnings \$150, \$170, and \$140 respectively. If the first two groups contain 17 and 12 people respectively and the combined average of earnings is \$153.25, find the number of people in the last group.

13. In a certain factory there are four working groups and they need 3, 4, 5, and 2 hours per product to make. What is the approximate average time required to make a product by those groups?

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14. In a class of 35 students the CGPA of the class are summarized as the sums $\sum f_i x_i = 112$ and $\sum f_i x_i^2 = 562$. Find their mean and standard deviation.

15. 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.

    (a). Find the value of the constant a.
    (b). Find the standard deviation of x.

16. A group of 10 married couples and 3 single men found that the mean age $\bar{x}_w$ of the 10 women was 41.2 years and the standard deviation of women's ages was 15.1 years. For the 13 men, the mean age $\bar{x}_m$ was 46.3 years and the standard deviation was 12.7 years.

    (a). Find the mean age of whole group of 23 people.
    (b). The individual women's ages are denoted by x_w and individual men's ages are denoted by x_m. Find $\sum x_w^2$ and $\sum x_m^2$.
    (c). Estimate the standard deviation of the whole group.

17. If the mode of a certain frequency table is 65.5 and the lower limit of the modal class is 60.5 with the class size 10, find the frequency of the modal class. Here frequency difference of the modal class and pre-modal class is 7 and frequency of post-modal class is 14.

18. If the standard deviation of a frequency table is 3.6 and coefficient of standard deviation is 6.55%, find the arithmetic mean of that table.

19. Suppose the first four raw moments of a population are -3.7, 94, -547.2, and 1200 respectively.

    (a). Find the first four central moments.
    (b). Estimate the coefficient of skewness and kurtosis.
    (c). Show your result graphically and comment about your findings.

20. If co-efficient of skewness and kurtosis of a frequency distribution are -0.95 and 4.32, respectively. Explain the shape of the distribution.