Lecture 4

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Dr. Manoj
Kumar

Outline of
Lecture 4

Graphic
Presentations
of Frequency
Distrbutions

Histograms

Frequency
Polygons

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Curves

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References

Lecture 4

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• Graphic Presentations of Frequency Distrubutions.

In this section we shall discuss how to present frequency distrubution graphically. Graphs present data in a two-dimensional picture. On the horizontal axis, we show the values of the variable. On the vertical axis, we mark the frequencies of the classes shown on the horizontal axis.

A frequency distrubution can be presented graphically in any of the following ways:

1. Histograms 2. Frequency Polygons

3. Frequency Curves 4. Ogives or Cumulative Frequency Curves

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1. Histograms 2. Frequency Polygons
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A histogram is the most widely used way of presenting a given frequency distrubution graphically.

Example 1: Draw a histogram to represent the following data:
Daily wages (Rs.): 0-10 10-20 20-30 30-40 40-50 50-60
No. of Workers: 3 9 15 30 18 5
Solution: On the horizontal axis, we have shown the class intervals. On the vertical axis, we have marked the frequencies of the classes shown on the horizontal axis.

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Histograms

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Example 2: Draw a histogram to represent the following data:
Mid-Value(X): 115 125 135 145 155 165
No. of Workers: 3 6   8   7   4   2
Hint: If the mid-values of various classes are given in place of
class intervals then these must first be converted into classes.

Fig. 2.

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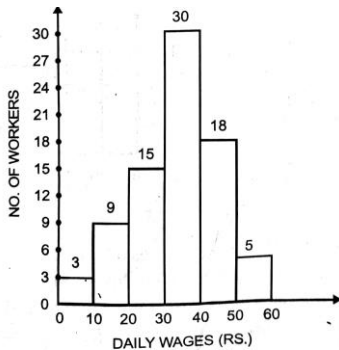Polygons

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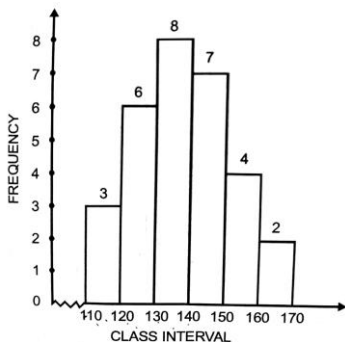

Fig. 2.

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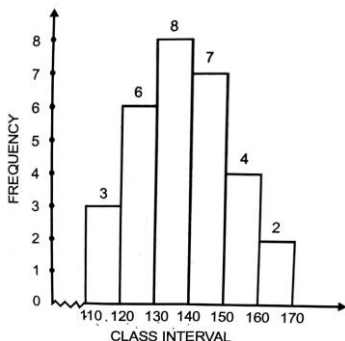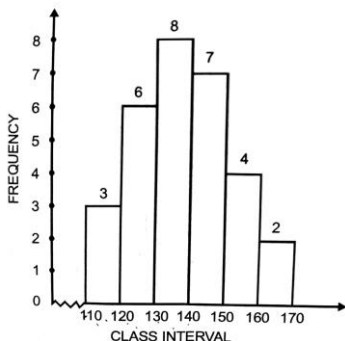class intervals then these must first be converted into classes.

Fig. 2.

A frequency polygon is another way of representing a given frequency distrubution in graphic form. Frequency Polygons are more suitable than histograms if we wish to compare two or more frequency distrubution.

A frequency polygon is constructed by first drawing the histogram and then joining the modpoints of the tops of the adjacent rectangles by straight lines. The mid points of both ends to the horizontal axis, resulting in a polygon.

A frequency polygon can also be constructed without first drawing the histogram. The frequency polygon is constructed by plotting each class frequency by drawing a dot (.) against its class mark and then connecting the successive dots with straight lines.

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Frequency Polygons

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Example 3:   Draw a frequency polygon for the following distrubution of marks obtained by 50 students in an examination:

Marks Obtained: 10-20 20-30 30-40 40-50 50-60 60-70 70-80
No. of Students: 2   3   7   13   11   9   4

Marks Obtained: 80-90
No. of Students: 01

Solution: To construct the frequency polygon, we mark the frequency on the vertical axis and the values of the variable (i.e., marks) on the horizontal axis. Next, we construct the histogram representing the given frequency distribution and then join the mid points of the tops of the adjacent rectangles with straights lines to form a polygon.

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Frequency Polygons

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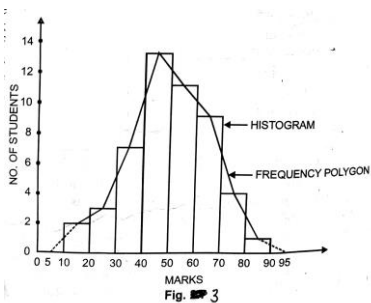Graphic
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Example 4:   Draw a frequency polygon for the following
distrubution:
Class Interval: 15-25 25-35 35-45 45-55 55-65 65-75
Frequency: 10   16   18   15   13   4
Here the frequency polygon is constructed by plotting each
class frequency by drawing a dot (.) against its class mark and
the connecting the succesive dots with straights lines.

Example 4: Draw a frequency polygon for the following distrubution:

Class Interval: 15-25 25-35 35-45 45-55 55-65 65-75

Frequency: 10   16   18   15   13   4

Here the frequency polygon is constructed by plotting each class frequency by drawing a dot (.) against its class mark and the connecting the succesive dots with straights lines.

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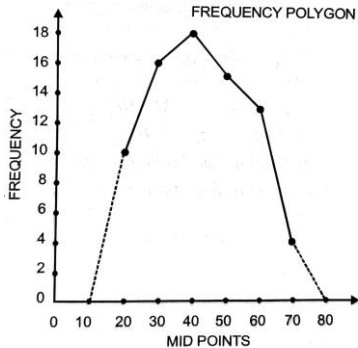**Frequency
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Fig. 4

If the class intervals in a distribution are continuously reduced in size and if the no. of items in the distribution is continuously increased, the frequency polygon will resemble a smooth curve, called a smoothed frequency curve, or simply a frequency curve.

A frequency curves can be obtained from the histogram by joining the midpoints of the tops of the adjacent rectangles by a free hand.

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Frequency Curves

Example 5: Draw a frequency curves for the following distrubution of marks obtained by 50 students in an examination:

Marks Obtained: 10-20 20-30 30-40 40-50 50-60 60-70 70-80
No. of Students: 2   3   7   13   11   9   4
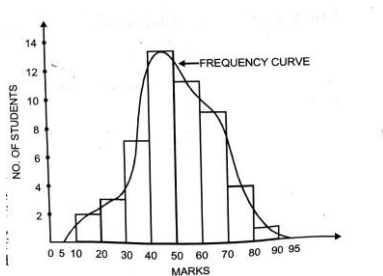Marks Obtained: 80-90
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Fig. 2.9

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Ogives

An Ogive (pronounced oh-jive) is a graphic presentation of a cumulative frequency distribution. Since a cumulative frequency distribution can be of less than or more than type therefore there are two types of ogives viz., less than ogives or more than ogives.

Less than ogives: An ogive assocaited with a less than cumulative frequency is called less than ogives. A less than ogives is constucted by plotting points determined by the upper class boundary and the cumulative frequency of the individual classes and then connected the succesive points by a freehand curve. A less than ogive will be ascending.

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More than ogives: An ogive assocaited with a more than cumulative frequency is called more than ogives. A more than ogives is constucted by plotting points determined by the lower class boundary and the cumulative frequency of the individual classes and then connected the succesive points by a freehand curve. A more than ogive will be descending.

Example 6:   The following data shows the marks obtained by 100 students in an examination:

Marks Obtained: 0-10 10-20 20-30 30-40 40-50 50-60

No. of Students: 10   9   25   30   10   16

(i) Construct a less than cumulative frequency distribution for the given data.

(ii) Construct a less than ogives of the cumulative frequency distribution of the given data.

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SOLUTION. (i) LESS THAN CUMULATIVE FREQUENCY DISTRIBUTION

Marks (Frequency)	No. of Students	Marks	No. of Students (Cumulative Frequency)
0 – 10	10	Less than 10	10
10 – 20	9	Less than 20	19
20 – 30	25	Less than 30	44
30 – 40	30	Less than 40	74
40 – 50	10	Less than 50	84
50 – 60	16	Less than 60	100

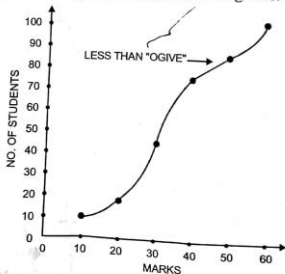(ii) The "less than" ogive for the given data is shown in Fig. 2.10.

Fig. 2.10

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Example 7:   Given below is the distribution of weights of a
group of 60 students in a class:
Weights (in kg):   30-34 35-39 40-44 45-49 50-54 55-59
No. of Students: 03   5   12   18   14   06
Weights (in kg):   60-64
No. of Students: 02
Draw a more than ogive for the above data.

SOLUTION. A "more than" ogive is determined by the lower class boundary and the cumulative frequency of the individual classes.

MORE THAN CUMULATIVE FREQUENCY DISTRIBUTION

Weight (in kg) (Class Boundary)	No. of Students	Weight	No. of Students (Cumulative Frequency)
29.5 – 34.5	3	More than 29.5	60
34.5 – 39.5	5	More than 34.5	57
39.5 – 44.5	12	More than 39.5	52
44.5 – 49.5	18	More than 44.5	40
49.5 – 54.5	14	More than 49.5	22
54.5 – 59.5	6	More than 54.5	8
59.5 – 64.5	2	More than 59.5	2

The "more than" ogive for the given data is shown in Fig. 2.11.

Fig. 2.11
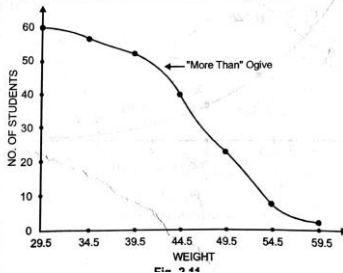
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Thanks !!!