Assignment 2

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1 NCERT-Class-9-Statistics

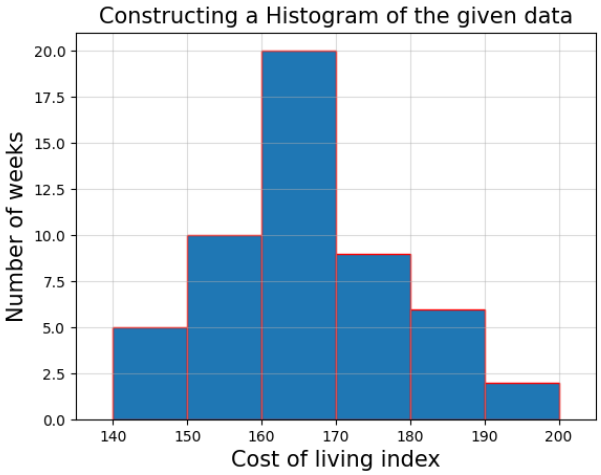
Example 9: In a city, the weekly observations made in a study on the cost of living index are given in the following table:

Cost of living index	Number of weeks
140-150	5
150-160	10
160-170	20
170-180	9
180-190	6
190-200	2
Total	52

Draw the frequency polygon for the data above (without constructing a histogram).

Solution:

- **Constructing a Histogram** We can come up with a histogram for a better understanding on the arranged data.
  Representing the data, as per the given data.



- **Constructing a Frequency Polygon** Finding the class-marks of the above classes.

  – For 140-150, the upper-limit is 150 and the lower limit is 140.
  So the class-mark $= \frac{150+140}{2} = \frac{290}{2} = 145.$

  – For 150-160, the upper-limit is 160 and the lower limit is 150.
  So the class-mark $= \frac{160+150}{2} = \frac{310}{2} = 155.$

  – For 160-170, the upper-limit is 170 and the lower limit is 160.
  So the class-mark $= \frac{170+160}{2} = \frac{330}{2} = 165.$

  – For 170-180, the upper-limit is 180 and the lower limit is 170.
  So the class-mark $= \frac{180+170}{2} = \frac{350}{2} = 175.$

  – For 180-190, the upper-limit is 190 and the lower limit is 180.
  So the class-mark $= \frac{190+180}{2} = \frac{370}{2} = 185.$

  – For 190-200, the upper-limit is 200 and the lower limit is 190.
  So the class-mark $= \frac{200+190}{2} = \frac{390}{2} = 195.$

  Tabulating the above class-marks corresponding to their classes.

Classes	Class-marks	Frequency
140-150	145	5
150-160	155	10
160-170	165	20
170-180	175	9
180-190	185	6
190-200	195	2
Total		52

We can now draw a frequency polygon by plotting the class-marks along the horizontal axis, the frequency along the vertical axis, and then plotting and joining the points B(145,5), C(155,10), D(165,20), E(175,9), F(185,6) and G(195,2) by line segments.

Note: We should plot the point corresponding to the class-mark of the class 130-140 (just before the lowest class 140-150) with zero frequency, i.e., A(135,0), and the point H(205,0) occurs immediately after G(195,2).

Therefore, plotting the resulting frequency polygon as ABCDEFGH. The shaded portion represents the polygon required.