# Ch-13 Statistics

1. Let's remember that the mean, mode and median are measures of central tendency, i.e., numerical representatives of the given data.
2. Class mark = $\frac{upper\ limit + lower\ lomit}{2}$.
3. Mean of the grouped data –
   a. Using direct method –
      i. For each class, find the class mark, $x_i$.
      ii. Calculate $f_i x_i$ for each class.
      iii. Use the formula – $\bar{x} = \frac{\sum f_i x_i}{\sum f_i}$.
   b. Using assumed mean method –
      i. For each class, find the class mark, $x_i$.
      ii. Choose an assumed mean 'a' from the $x_i$'s. (Preferably, the centre one)
      iii. Calculate $d_i = x_i - a$ for each class.
      iv. Calculate $f_i d_i$ for each class.
      v. Use the formula – $\bar{x} = a + \frac{\sum f_i d_i}{\sum f_i}$.
   c. Using step deviation method –
      i. For each class, find the class mark, $x_i$.
      ii. Choose an assumed mean 'a' from the $x_i$'s. (Preferably, the centre one)
      iii. Calculate $u_i = \frac{x_i - a}{h}$, where, h is the class size.
      iv. Calculate $f_i u_i$ for each class.
      v. Use the formula – $\bar{x} = a + h\left(\frac{\sum f_i u_i}{\sum f_i}\right)$.
4. The mode of the grouped data = $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right)$ x h,

   Where, l = lower limit of the class,
   h = size of the class,
   $f_1$ = frequency of the modal class,
   $f_0$ = frequency of the preceding class, and
   $f_2$ = frequency of the succeeding class.
5. The cumulative frequency of a class is the frequency obtained by adding the frequencies of all the class preceding the given class.
6. Median of the grouped data = $l + \left(\frac{\frac{n}{2} - c.f.}{f}\right)$ x h,

   Where, l = lower limit of the median class,
   n = number of observations,
   c.f. = cumulative frequency of the class preceding the median class,
   f = frequency of the median class, and
   h = class size.