NORMAL DISTRIBUTION

In a population many characteristics show a complete gradation without any break, from one extreme to the other. This is signified most closely by characteristics such as mass, linear dimension, shape and colour of organisms.

If measures of distribution are arranged in linear fashion and vary continuously on both the sides from the central value, then the distribution is called normal distribution. In normal distribution measures are concentrated closely around the centre and taper off from this central high point to the left and right. The normal distribution is concerned with all numbers whether complete or in a fraction.

The use of normal distribution to biological data was pioneered by Sir Frances Galton. He studied the quantitative characters and their inheritance

Normal Distribution Curve

A normal distribution curve is a graphical representation of a given data in symmetrical manner i.e, with equal number of observations on both the sides of mean value. This curve is also known as 'Gaussian Curve'. This curve is continuous for continuous variables.

It shows that the mean value of the variable lie at the peak of the curve and the largest number of observations lie at this point. Its the ordinate divides the area under the normal curve into two equal parts, the median of distribution coincides with the mean.
The points of inflection of the normal curve are equidistant from the mean. The variables having lower values lie on the left side of the mean and variables having higher values lie at the right side of mean.

The normal distribution is characterised by the following equation —

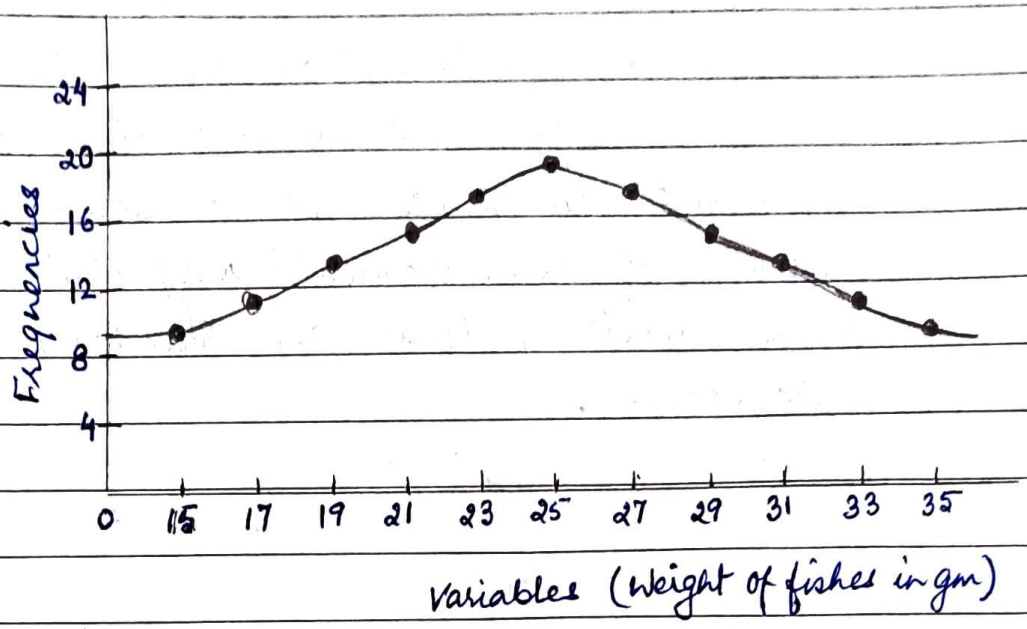
$$f(Y) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$$

Where, μ = mean
σ = Standard deviation
π = 3.14159 - - -
e = 2.71828 - - -

Normal Curve — Example

The body weight in gm and the frequencies of 149 fishes are given below Plot a graph.

Wt. of fishes :	15	17	19	21	23	25	27	29	31	33	35
freq. :	9	11	13	15	17	19	17	15	13	11	9



PROPERTIES OF NORMAL DISTRIBUTION CURVE-

1. It presents a continuous bell shaped normal distribution curve. It associates with continuous variables such as, height, weight, rate of respiration etc.
2. The normal curve is symmetrical and asymptotic with only one maximum peak.
3. The height of the normal curve is maximum at its Mean. Hence, Mean and Mode of normal distribution coincide. As the peak of the normal curve divides the distribution into two equal parts, the Mean and Median ~~dss~~ also coincide. Thus for a normal distribution, Mean = Median = Mode.
4. Most of the observations are clustered

around the mean and there are relatively a few observations at the extremes.

5. The normal distribution curve has a fixed mathematical characteristic feature independent of the scale (unit of measurement) magnitude and unit of Mean and Standard Deviation.

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