7. Plotting and fitting of Normal distribution and graphical representation of probabilities.

We define Normal Distribution as the probability density function of any continuous random variable for any given system. Now for defining Normal Distribution suppose we take f(x) as the probability density function for any random variable X.

f(x) ≥ 0 ∀ x ϵ (−∞,+∞),

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

where,

- *x is* ***Random Variable***
- *μ is* ***Mean***
- *σ is* ***Standard Deviation***

Properties of Normal Distribution

- *For normal distribution of data, mean, median, and mode are equal, (i.e., Mean = Median = Mode).*
- *Total area under the normal distribution curve is equal to 1.*
- *Normally distributed curve is symmetric at the center along the mean.*
- *In a normally distributed curve, there is exactly half value to the right of the central and exactly half value to the right side of the central value.*
- *Normal distribution is defined using the values of the mean and standard deviation.*
- *Normal distribution curve is a Unimodal Curve, i.e. a curve with only one peak*

how to implement in excel

1. Input your data set into an Excel spreadsheet

2. Find the mean of your data set

=AVERAGE(cell range)

- *"cell range" is a required component and the range of cells where your data exists, such as cells A1 through A64. You can write this in the function as A1:A64.*

3. Find the standard deviation of your data set

=STDEV(cell range)

4. Select a value for the distribution

5. *Type the NORM.DIST function and fill*

NORM.DIST(x,mean,standarddeviation,cumulative)

NORM.DIST(x,mean,standarddeviation,FALSE)

Employee	incentive	Normal Distribution
EMP1	1000	1.43472E-05
EMP2	2000	1.77407E-05
EMP3	3000	2.15356E-05
EMP4	4000	2.56641E-05
EMP5	5000	3.00245E-05
EMP6	6000	3.44833E-05
EMP7	7000	3.88799E-05
EMP8	8000	4.3035E-05
EMP9	9000	4.6763E-05
EMP10	10000	4.98843E-05
EMP11	11000	5.22406E-05
EMP12	12000	5.37075E-05
EMP13	13000	5.42056E-05
EMP14	14000	5.37075E-05
EMP15	15000	5.22406E-05
EMP16	16000	4.98843E-05
EMP17	17000	4.6763E-05
EMP18	18000	4.3035E-05
EMP19	19000	3.88799E-05
EMP20	20000	3.44833E-05
EMP21	21000	3.00245E-05
EMP22	22000	2.56641E-05
EMP23	23000	2.15356E-05
EMP24	24000	1.77407E-05
EMP25	25000	1.43472E-05

mean	13000
standand Deviation	7359.800722