* Poisson distribution

→ The poisson distribution is a discrete prob distribution that describes the no of events that occur within a fixed interval of time or space given a known average rate of occurrence.

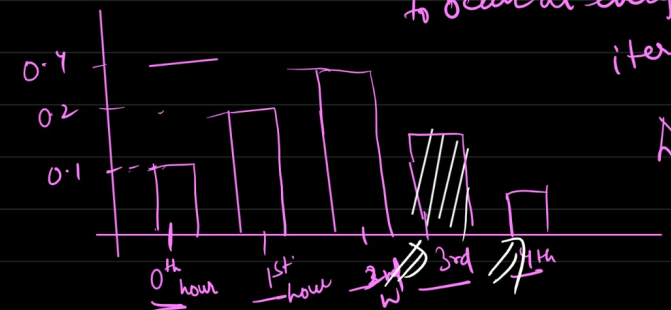
* No of events occurring in a fixed time interval.

ex: No of Calls recieved by a customer care every hours.

λ → Expected No of events to occur at every time interval.

ex: No of people visiting temple/hospital/banks/airport every hour.

pmf:



$\lambda = 100$

eg: No of accident every hour at a busy route

eg: No of emails recieved every hour.

pmf $\Rightarrow P(X=x) \Rightarrow \frac{e^{-\lambda} \cdot \lambda^x}{x!}$

e is -2.71828

λ – avg rate of events every interval

$\lambda = 10$ P visiting at 5th hour

$P(X=5) = \frac{e^{-\lambda} \lambda^x}{x!} \Rightarrow \frac{(2.718)^{-10} \cdot 10^5}{5!} \Rightarrow$

eg: The avg number of customers entering a store in an hour is 5. What is the prob of exactly 3 customers will enter the store next hour?

→ $\lambda = 5$

$P(X=3) \quad \frac{e^{-\lambda} \cdot \lambda^k}{k!} \Rightarrow \frac{e^{-5} \cdot 5^3}{3!}$

$$\Rightarrow \frac{(2.718)^{-5} \times 125}{6}$$

$$\Rightarrow \frac{0.00674 \times 125}{6} \simeq 0.14$$

Mean $\rightarrow$ $\lambda \times t$ (Avg no of events at every interval)

Variance $\rightarrow$ $\lambda \times t$