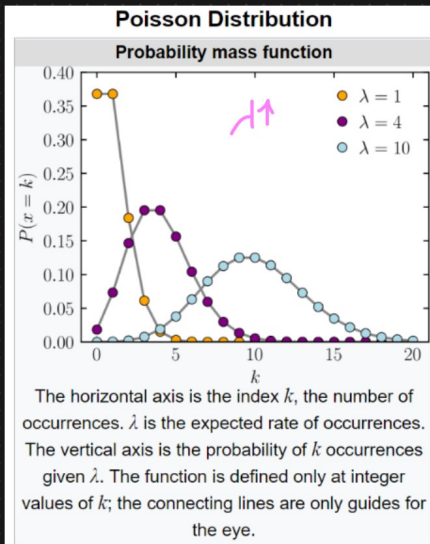


Poisson Distribution

In probability theory and statistics, the **Poisson distribution** is a **discrete probability distribution** that expresses the probability of a given **number of events occurring in a fixed interval of time** if these events occur with a known constant mean rate and independently of the time since the last event.

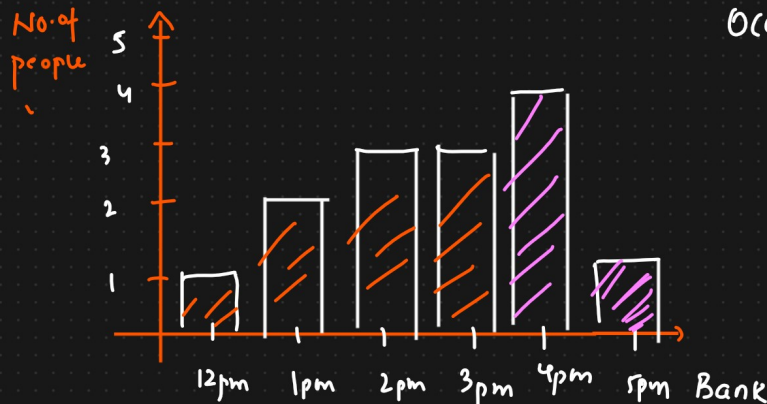


① Discrete random variable (pmf)

② Describes the numbers of events occurring in a fixed time intervals

Eg: No. of people visiting hospital every hour }
No. of people visiting banks every hour }

$\lambda = 3 \Rightarrow$ Expected no. of events occurring at every time interval



PMF

$$P(x=r) = \frac{e^{-\lambda} \lambda^x}{x!}$$

$$\boxed{\lambda = 3}$$

$$Pr(x \leq 3)$$

$$= \frac{e^{-3} 3^5}{5!} = 0.101 = 10.1\%$$

$$\underline{Pr(x=4) + Pr(x=5) = \text{final} \Rightarrow \text{probability}}$$

Mean of Poisson Distribution

$$\text{Mean} = E(x) = \mu = \lambda * t$$

Variance



λ = Expected No. of events occur at every time interval

t = Time interval