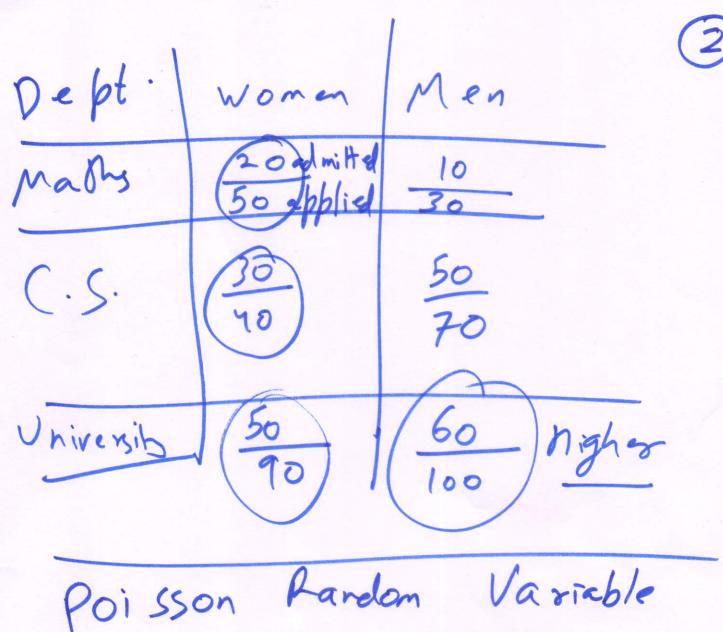
Lectuse-11 Recapi. random variable Bernoulli random Variable. Binomial (H. W.) Var(x) = np(1-b)] Spinbowler Fast bowler 202 balls Dhoni Simpson's bandox



Poisson Random Variable

Let X = 0,1,2,3,... $p(X = i) = e^{-\lambda} \frac{\lambda^{i}}{i!}$

 $\frac{2}{5}p(x=i) = 1$ = $\frac{2}{5}e^{-1}\frac{1}{1!}$

1 =0 3 (i).e-1 3 x; pi

=1

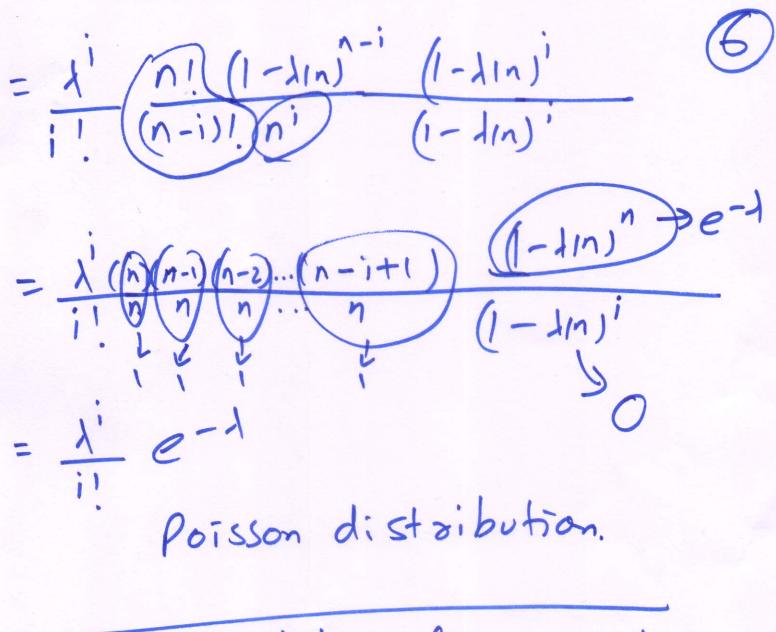
$$\frac{2}{1} = 0$$

$$\frac{1}{1} = 0$$

$$\frac{1}{1!} = 0$$

 $Var(X) = \lambda$ (H.W.)

Poisson is a good (5) approximation to binomial for n large, psmall with np of moderate size E(X) = (p = 1)Binomial b = 1 Poisson $P(X=i) = \binom{n}{i} p^{i} (1-p)^{n-i}$ $=\binom{n}{i}\left(\frac{1}{n}\right)^{i}\left(1-\frac{1}{n}\right)^{n-i} + \frac{1}{poisson}$ $=\frac{n!}{i!6-ij!}\frac{\lambda}{n^{i}}\left(1-\frac{\lambda}{n}\right)^{n-i}$



e.g. probability of a certain item being defective 0.1

Sample of 10 items.

Platmost 1 item out f10

Plis defective, i.e., at least

9 are not defective.

$$X = no \cdot f$$
 defective \mathcal{D}
items.
 $V = o(1 + P(X = 1))$

$$P(X=0) + P(X=1)$$

$$k=0$$

$$|x=0|$$

$$|x=0$$

$$Po_{1350n}: \lambda = np = 1$$
 $e^{-1}(\frac{1}{1+1}) = e^{-1}(\frac{1+1}{1+1}) = \frac{1+1}{6}$
 $0: 7357 = \frac{2}{6}$

Geometric Pandom Variable.

Repeating an experiment until the 1st success.

P(success) = p

P(failure) = 1-p

X= no. of trials until you

get the 181 success.

 $x \in \{1, 2, 3, \dots \}$

$$\sum_{i=1}^{5} (1-p)^{i-1} \cdot p = S$$

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$$S = p + (1-p) p + (1-p)^{2} p + \cdots$$

$$= p(1+(1-p)+(1-p)^{2} + \cdots)$$

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$$= p(1-(1-p) - 1$$

$$= \frac{p \cdot 1}{1-(1-p)} - 1$$

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e.g. 20 white balls.

30 black balls.

taking out a ball, noting its

(olos), and putting it back in

the bag. Pepcal until you get a

black ball.

$$P(x = b)$$

$$= (\frac{2}{5})^{b-1} \cdot \frac{3}{5}$$

$$= \frac{2^{b-1} \cdot 3}{5^{b}}$$

what is the probability that you take $\geq b$ at empts?

So $\rho(x=b) = \begin{cases} 2^{-1} \cdot 3 \\ 1-b \end{cases}$ i=b i=b f(w) f(w)