Jointly distributed random variables - Class 19

October 31, 2013 Debdeep Pati

1 Sum of two independent random variables

1. $X \sim \text{Bin}(n,p)$, $Y \sim Bin(m,p)$, X, Y independent of each other, then $X+Y \sim Bin(m+n,p)$
2. $X \sim Poiss(\lambda), Y \sim Poiss(\mu)$, X, Y independent of each other, $X+Y \sim Poiss(\lambda+\mu)$
3. $X \sim Poiss(\lambda), Y \sim Poiss(\mu)$, X, Y independent of each other, $X \mid X+Y=k \sim bin(k, \lambda/(\lambda+\mu))$ and $Y \mid X+Y=k \sim bin(k, \mu/(\lambda+\mu))$.