M 362K Pre-Class Work for 3/3

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4-29

$Pr(R < 2) = Pr(R = 0) + Pr(R = 1) = 0.1 + 0.9 * 0.1 = 0.19$

$E[R] = \frac{0.1}{0.9} = \frac{1}{9} \approx 0.11$

$Var[R] = \frac{0.1}{0.9^2} \approx 0.123$

$\sigma_R = \sqrt{Var[R]} = 0.3514$

Assumption: Each job hunting is independent with the others

4-44

(a)

Let M be the random variable which denotes the number of failures before the 3rd success

Then $Pr(M = 2) = {}_{3+2-1}C_2 0.35^3 * 0.65^2 = 0.1087$

(b)

Let X be the number of success

$Pr(X = 3) = {}_5C_3 0.35^3 * 0.65^2 = 0.1811$

(c)

Let M be the random variable which denotes the number of failures before the 3rd success

$E[M] = 3 * \frac{0.65}{0.35} = 5.5714$

$Var[M] = 3 * \frac{0.65}{0.35^2} = 15.918$

(d)

Let X be the number of total attempts. Then $X = M + 3$

$E[X] = E[M + 3] = E[M] + 3 = 8.5714$

4-50

$Pr(D < 3) = Pr(D = 0) + Pr(D = 1) + Pr(D = 2) = \frac{{}_{14}C_5}{{}_{41}C_5} + \frac{{}_{27}C_1 * {}_{14}C_4}{{}_{41}C_5} + \frac{{}_{27}C_2 * {}_{14}C_3}{{}_{41}C_5} = 0.2092$

$E[D] = 5 * \frac{27}{27+14} = 3.2927$

$Var[D] = 5 * \frac{27}{27+14} * \frac{14}{27+14} * \frac{27+14-5}{27+14-1} = 1.012$

$\sigma_D = \sqrt{Var[D]} = 1.006$