M 362K Pre-Class Work for 2/12

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3-10

$E[W] = 0 * Pr(W = 0) + 1 * Pr(W = 1) + 2 * Pr(W = 2) = \frac{{}_6C_1 * {}_5C_1}{{}_{11}C_2} + 2 * \frac{{}_6C_2}{{}_{11}C_2} = \frac{12}{11} \approx 1.09$

$E[W^2] = 0 * Pr(W = 0) + 1 * Pr(W = 1) + 2^2 * Pr(W = 2) = \frac{{}_6C_1 * {}_5C_1}{{}_{11}C_2} + 4 * \frac{{}_6C_2}{{}_{11}C_2} = \frac{18}{11} \approx 1.64$

3-12

From the distribution given in the table, we get $Pr(X = 39) = 1 - 0.16 - 0.42 - 0.1 - 0.28 = 0.04$

Let $E[X]$ denote the mean age

$\therefore E[X] = 32 * 0.16 + 39 * 0.04 + 45 * 0.42 + 57 * 0.1 + 62 * 0.28 = 48.64$

3-17

(a)

$percentage = 100 * \frac{3}{4+1} = 60$

(b)

let i be the i^{th} number

$i = \frac{50}{100} * 5 = 2.5$

let x_i be the value of the i^{th} number

$x_{2.5} = 43412 + (45500 - 43412) * 0.5 = 44456$

(c)

let i be the i^{th} number

$\therefore \frac{2}{3} = \frac{i}{5}$

$i = \frac{10}{3}$

let x_i be the value of the i^{th} number

$x_{\frac{10}{3}} = 45500 + (53750 - 45500) * (\frac{10}{3} - 3) = 48250$

(d)

let i be the rank of \$49,000

Then $45500 + (i - 3) * (53750 - 45500) = 49000$

$i = \frac{113}{33}$

$\therefore percentage = 100 * \frac{\frac{113}{33}}{5} \approx 68.48$