M 362K Pre-Class Work for 2/17

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3-26

From the probability distribution given in the question, we can get $Pr(X = 45) = 1 - 0.16 - 0.04 - 0.1 - 0.28 = 0.42$

$\mu_X = 32 * 0.16 + 39 * 0.04 + 45 * 0.42 + 57 * 0.1 + 62 * 0.28 = 48.64$

$Var[X] = 32^2 * 0.16 + 39^2 * 0.04 + 45^2 * 0.42 + 57^2 * 0.1 + 62^2 * 0.28 - 48.64^2 = 110.5504$

3-28

(a)

$mean = \frac{1}{12} * (78 + 48 + 69 + 102 + 78 + 93 + 69 + 84 + 96 + 59 + 87 + 93) = \frac{239}{3} \approx 79.67$

$median = 81$

There is no mode

$midrange = \frac{48+102}{2} = 75$

(b)

$min = 48$ and $max = 102$

(c)

Let i be the ith number

Therefore for the 80th percentile $\frac{80}{100} = \frac{i}{12+1}$

$i = 10.4$

The tenth number is 93 and the eleventh number is 96

Therefore the 80th percentile number is $93 + (96 - 93) * (10.4 - 10) = 94.2$

(d)

$Var[score] = \frac{1}{12} * (78^2 + 48^2 + 69^2 + 102^2 + 78^2 + 93^2 + 69^2 + 84^2 + 96^2 + 59^2 + 87^2 + 93^2) - \left(\frac{239}{3}\right)^2 =$

$\frac{8570}{33} \approx 259.70$

$\sigma = \sqrt{Var[score]} = \sqrt{259.70} \approx 16.12$

3-32

From the data given in this question, we can know

$\mu_{orange} = \frac{1}{10} * (14 + 12 + 10.5 + 9.3 + 8.4 + 7.6 + 5.9 + 5.4 + 4.8) \approx 8.65556$

$\mu_{apple} = \frac{1}{9} * (16 + 15 + 13.5 + 11.3 + 10.4 + 9.6 + 9.6 + 7.9 + 7.4) \approx 11.1889$

$\therefore Z_{orange} = \frac{16.4 - 8.65556}{2.85} = 2.72$

$Z_{apple} = \frac{19 - 11.1889}{2.848} = 2.74$

$\because Z_{apple} > Z_{orange}$

Therefore Ryan discovers the most impressive fruit