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Chapter 2.4

(1) a) $5+8+6+7+8+4/6 = 6.33$

$(5-6.33)^2 + (8-6.33)^2 + (6-6.33)^2 + (7-6.33)^2 + (8-6.33)^2 + (4-6.33)^2$

$= 13.33 / 6 = 2.22$

b) $\sqrt{2.22} = 1.49$

(2) a) $\Sigma fx = (0\times4)+(1\times8)+(2\times9)+(3\times17)+(4\times6)$

$= 101$

$\Sigma fx^2 = (0^2\times4)+(1^2\times8)+(2^2\times9)+(3^2\times17)+(4^2\times6)$

$= 293$

b) $\Sigma fx / \Sigma f = 101/(4+8+9+17+6) = 2.295$

$\sqrt{293/44 - (101/44)^2} = \sqrt{1.416} = 1.18$

(3) a) $35+40/2 = 37.5\,kg$

$\Sigma(f\times x)/n = 1410/30 = 47\,kg$

$(37.5-47)^2 = 90.25\,kg$

$1217.5\,kg^2/30 = 40.58\,kg^2$

$= 40.6\,kg$

b) $1217.5/29 = 41.984\,kg^2$

$\sqrt{41.98} = 6.37\,kg$

(4) a) $(5\times11)+(6\times15)+(7\times23)+(8\times16)$

$= 55+90+161+128 = 434$

$11+15+23+16 = 65$

$434/65 = 6.68$

$\sqrt{1.26} = 1.02$

Mean = 6.68 ladybirds

standard deviation = 1.02 ladybirds

b) Mean number of ladybirds is higher on the second day, but there was less variability

(5) a) $42.5\times5 = 21.25$

$4.75\times7 = 33.25$

$5.25\times8 = 42$

$5.75\times3 = 17.25$

$6.25\times1 = 6.25$

$\Big\} = 120$

$21.25+33.25+42+17.25+16.25 = 120$

$5+7+8+3+1 = 24$

$120/24 = 5$

fx^2: $\dfrac{90.31+157.81+220.5+99.19+39.06}{24} - s^2$

$= 0.28625$

$\sqrt{0.28625} = 0.540$

mean = 5 hours

standard deviation = 0.540

b) One standard deviation from the mean gives (4.46, 5.54) which gives a nominal frequency of 15.64 inside this interval. This is only 65.2% of round, so Sez is wrong

(6) $6\times5 = 30$

$5\times5.5 = 27.5$

$30+27.5 = 57.5$

$57.5/11 = 5.23$

mean: $(6-1)\times7+(5-1)\times6.5 = 61$

$6+5-2 = 9$

$61/9 = 6.78$

(7) $\sqrt{\dfrac{73.4.7}{31} - \left(\dfrac{477.4}{31}\right)^2} = 237.9 - 237.16$

$= \sqrt{0.74}$

$= 0.856°C$