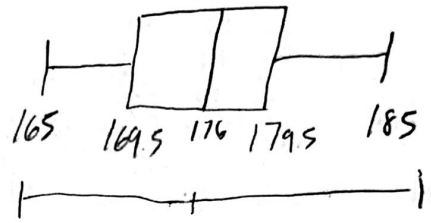
1)

min: 165
Q1: 169.5
median: 176
Q3: 179.5
max: 185.0



2) $\text{mean} = \frac{1}{n}\sum_{i=1}^{n} x_i = 175.2$

$\text{sample variance} = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x}) = \frac{1}{14}\sum_{i=1}^{15}(x_i - 175.2) = 41.17$

$\text{sample standard dev} = \sqrt{v} = \sqrt{41.17} = 6.42$

3)

i) $T_1 = \sum_{i=1}^{n}\frac{(x_i - \mu)^2}{\sigma^2} = \sum_{i=1}^{15}\frac{(x_i - 174)^2}{38} = 10884.74$ $\quad t_1 = \frac{17 - 174}{38} = 15.7$

$P(T_1 > t_1) = 1 - \text{pchisq}(15.7, 14) = .332$

ii) $T_2 = \sum_{i=1}^{15}\frac{(x_i - 175.2)^2}{38} = 11042.57$

$t_2 = \frac{(185 - 175.2)^2}{38} = 15.17$

$P(T_2 > t_2) = 1 - \text{pchisq}(15.17, 14) = .36$

iii) $T_3 = \frac{\bar{x} - \mu}{\sqrt{\frac{s^2}{n}}} = \frac{175.2 - 174}{\sqrt{\frac{6.42^2}{15}}} = .72$

4) i) $175.2 \pm 1.645 \frac{6.42}{\sqrt{15}}$ ~~$1-\alpha$~~ $\frac{1-\alpha}{2}$ 1.645

$175.2 + 1.645 \frac{6.42}{\sqrt{15}} = 177.93$

$175.2 - 1.645 \frac{6.42}{\sqrt{15}} = 172.45$

$(172.45, 177.93)$

i) $\bar{x} \pm \frac{\sigma}{\sqrt{n}} = 175.2 \pm \frac{\sqrt{38}}{\sqrt{15}} =$ ($\sigma^2 = 38$) $(172.66, 177.74)$

$175.2 + \frac{\sqrt{38}}{\sqrt{15}} = 172.66$

$175.2 - \frac{\sqrt{38}}{\sqrt{15}} = 177.74$

ii) $\alpha = \frac{1-.89}{2} = .055$

$t = 1.753$

$\frac{\sqrt{38}}{\sqrt{16}} \frac{\sqrt{38}}{\sqrt{15}} = 1.54$

$1.54 \cdot 1.753 = 2.7$

ii) $\frac{(n-1)s^2}{\chi^2_{\alpha/2}} < \sigma^2 < \frac{(n-1)s^2}{\chi^2_{1-\alpha/2}}$

$\frac{15 \cdot 38}{25.} < \sigma^2 < \frac{15(38)}{7.261}$

$(172.5, 177.7)$

~~$(22.8, 78.5)$~~

$22.8 < \sigma^2 < 78.5$

6) $X \sim G(p)$ with SRS $(x_1 \dots x_n)$

then $E(x) = \frac{1}{\hat{p}} = \frac{1}{n} \sum_{i=1}^{n} x_i = \bar{x}_n$???

$\hat{p} = \frac{1}{\bar{x}_n}$

5)

$$f(x) = \begin{cases} \frac{1}{2\theta+1}, & 0 \le x \le 2 \\ 0, & \text{otherwise} \end{cases} \rightarrow \begin{cases} \left(\frac{1}{2\theta+1}\right)^n & 0 \le x_i < \theta \\ 0, & \text{otherwise} \end{cases}$$

???

$$= -n \ln(2\theta+1)$$

$$\frac{d}{d\theta}\left(-n \ln(2\theta+1)\right) = \frac{-n}{2\theta+1} < 0$$

7) $X \sim N(\mu, \theta^2)$ $x \sim N(\mu_2, \theta_2^2)$

$X_1 + X_2 \sim N(\mu_1 + \mu_2, \theta_1^2 + \theta_2^2)$ $2X+3Y$ (???)

$X \sim N(-1, 8)$ and $Y \sim N(1, 4)$

$X+Y \sim N(0, 13)$ $X-Y \sim N(-2, 13)$

$2X+3Y \sim N(0, 26)$