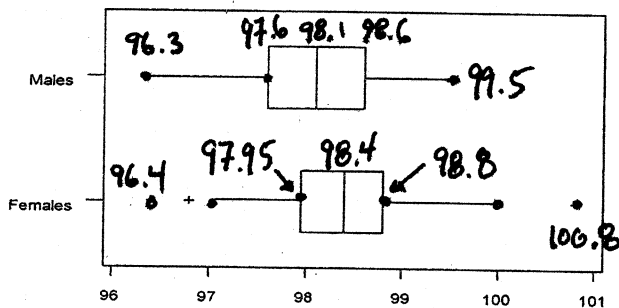


Part 2: Free Response

Communicate your thinking clearly and completely.

11. We all "know" that the body temperature of a healthy person is 98.6 °F. In reality, the actual body temperature of individuals varies. Here is a back-to-back stemplot of the body temperatures of 130 healthy individuals (65 males and 65 females).

(a) Here are boxplots, produced by Minitab, for these distributions. Label both boxplots with the 5-number summary values.



Males	Females
3	96
7	96
9	96
1110	97
32	97
544444	97
7666	97
998888	97
11000000	98
332222	98
554444	98
77666666	98
9888	98
1000	99
32	99
54	99
	99
	99
100	0
100	
100	
100	
100	8

(b) Determine whether the 3 points graphed by the + symbol are indeed outliers by our defined criteria.

$$\begin{aligned} \text{The IQR for Females} &= 98.8 - 97.95 \\ &= 0.85 \end{aligned}$$

Now $Q_1 - 1.5(IQR) = 96.675$. So 96.4 is an outlier, but 96.7 is not.

Also, $Q_3 + 1.5(IQR) = 100.075$. So definitely 100.8 is an outlier.

(c) Write a few sentences comparing the body temperatures of adult males and females.

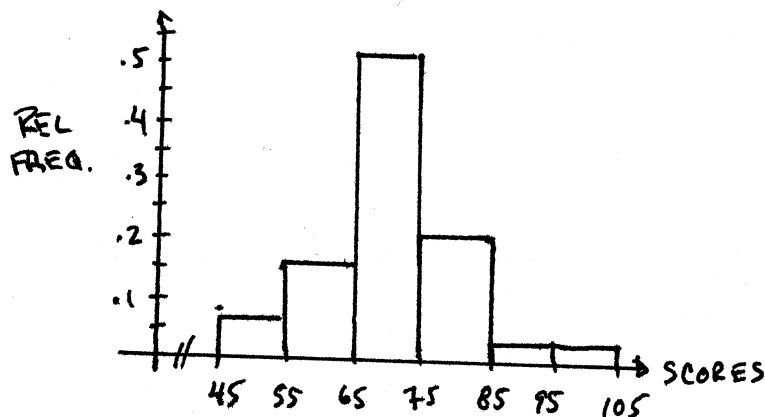
The temperatures for both males and females are quite symmetric, even though the female distribution has outliers at 96.4°F and 100.8°F. The median temperature for males, 98.1°F, is a little lower than the females', 98.4°F, however the males' temperatures were more variable with an IQR of 1°F, contrasted with the females' IQR = 0.85°F.

12. The following data represent scores of 50 students on a calculus test.

72	72	93	70	59	78	74	65	73	80
57	67	72	57	83	76	74	56	68	67
74	76	79	72	61	72	73	76	67	49
71	53	67	65	100	83	69	61	72	68
65	51	75	68	75	66	77	61	64	74

(a) Construct a relative frequency histogram for this data set.

CLASS (SCORES)	REL FREQ
45-55	.06
55-65	.16
65-75	.52
75-85	.22
85-95	.02
95-105	.02



(b) Are there any outliers? Justify your answer numerically.

There are 3 outliers, 2 high and 1 low.

The low outlier is $49 < 65 - 1.5(10) = 50$, and the

high outliers $93, 100 > 75 + 1.5(10) = 90$.

(c) Describe the shape, center, and spread of the distribution of test scores.

The shape of the scores is quite symmetric

with a mean of 69.94 and standard deviation of 9.57.

I pledge that I have neither given nor received aid on this test. _____