

# Homework #2 Solutions

Problems 1.45, 1.49, 1.57, 1.59, 1.134

## Problem 1.45

(a)

0	
0	89
1	00234
1	5558899
2	0000000000011112222222223
2	59
3	0
3	5
4	00
4	
5	0

Since \$20 is the most common value it is likely this is the amount charged by AOL

(b)  $IQR$  is 13th observation in sorted list  $\Rightarrow 18$   
 $UQ$  is 38th observation in sorted list  $\Rightarrow 22$   
 $IQR = UQ - LQ = 22 - 18 = 4$      $UQ + 1.5IQR = 22 + 1.5(4) = 22 + 6 = 28$

By 1.5 IQR Criterion

29, 30, 35, 40, 42, 50 are all outliers

By eyeballing the stemplot it appears that

50 is definitely an outlier and possibly the 40's also.

Problem 1.49

(a)

		7	0	5			
		8	8				
		9	1	2			
9	3	1	10	4	8	9	
	5	1	11	3	4	5	5
9	6	6	12	6			
	7	7	13	2			
	8	0	14	0	6		
4	4	2	15	1			
	5	5	16	9			
	8		17				
			18	0	7		
			19				
0			20				

Women

Men

(b) For Women median will be average of 9th, 10th observations

$$\frac{137 + 140}{2} = 138.5$$

For Men median will be average of 10th, 11th observations

$$\frac{114 + 115}{2} = 114.5$$

For women mean is  $\frac{154 + 109 + \dots + 148}{18} = 141.0556$

For Men mean is  $\frac{108 + 140 + \dots + 104}{20} = 121.25$

In both cases the means are slightly above the medians therefore the distributions are right (positively) skewed.

c)

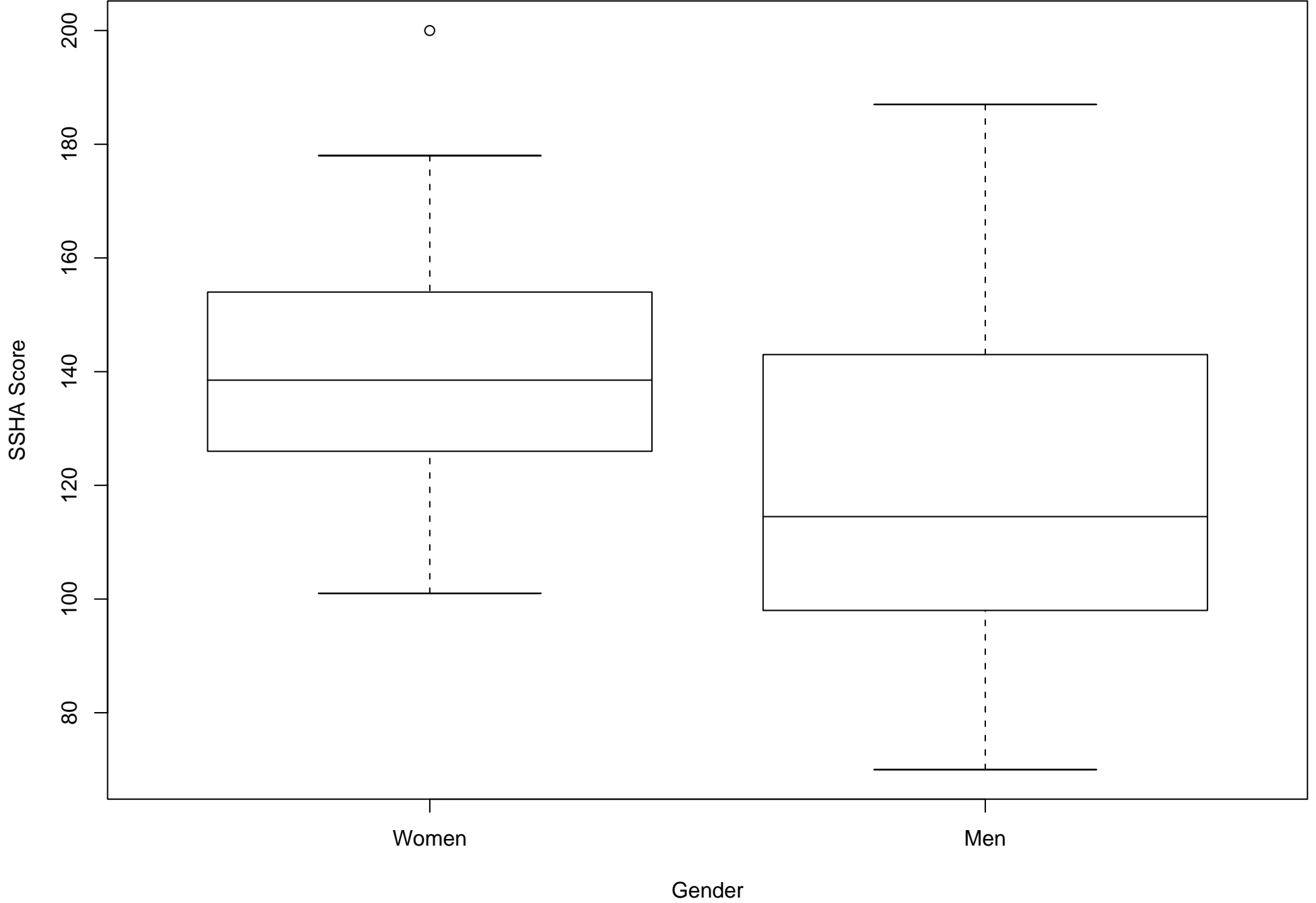
	Min	LQ	Median	UQ	Max
Women	101	126	138.5	154	200
Men	70	98	114.5	143	187

Women:  $IQR = 154 - 126 = 28$        $UQ + 1.5 IQR = 154 + 42 = 196$   
 $Q1 - 1.5 IQR = 126 - 42 = 84$

$\Rightarrow$  only 200 is an outlier.

Boxplot attached.

SSHA scores by gender



d) On average women have higher SSHA scores than men. SSHA scores for men are more spread out than they are for women. All three tools show these differences. The boxplot makes this particularly clear.

### Problem 1.57

(Note some people may boxplot calories, this is acceptable)

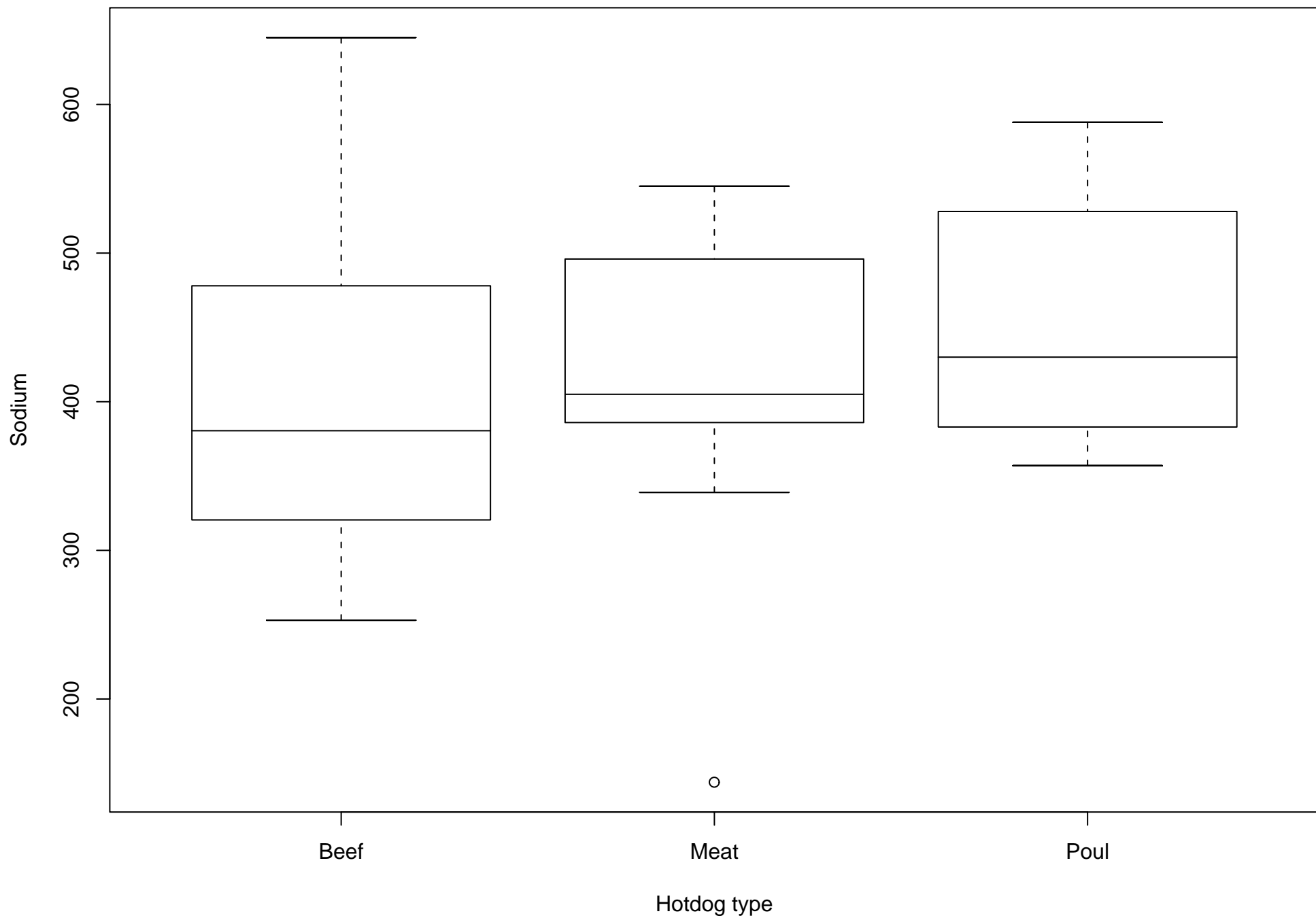
Boxplots attached

Summary statistics for sodium by Hot dog type

Hotdog type	Min	LQ	Median	UQ	Max	Mean
Beef	253	321.3	380.5	<del>407.5</del> 645	645	401.2
Meat	144	386	405	496	545	418.5
Poultry	357	383	430	528	588	459

From the boxplots we see that in general poultry hotdogs have highest sodium levels

**Sodium by hotdog type**



## Problem 1.59

salaries paid last year

\$5000, 25000, 25000, 25000, 25000, 60000, 60000, 255000  
5 clerks                      2 jr accountants                      owner

Median salary 25000

mean salary 62500

7 of the 8 people earn less than the mean.

## Problem 1.134

(a) see attached histogram

(b) 5 number summary

Min	LQ	Median	UQ	Max
1919	1938	1960	1980	1998

It tells us that about half the housing is newer than 40 years old and half is older. <sup>there are many old houses</sup>

### Histogram of Housing Unit Ages

