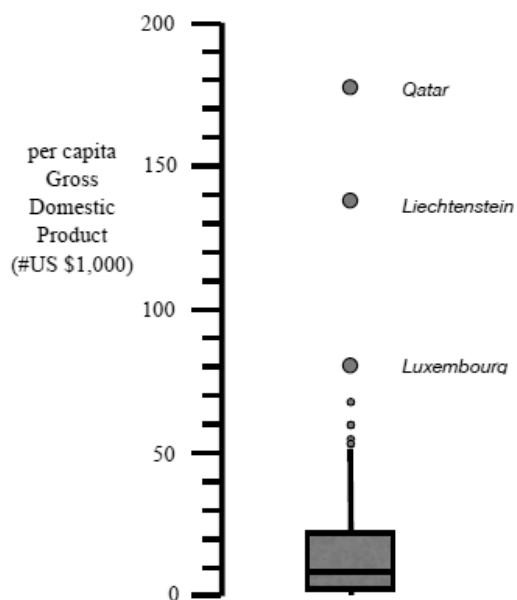


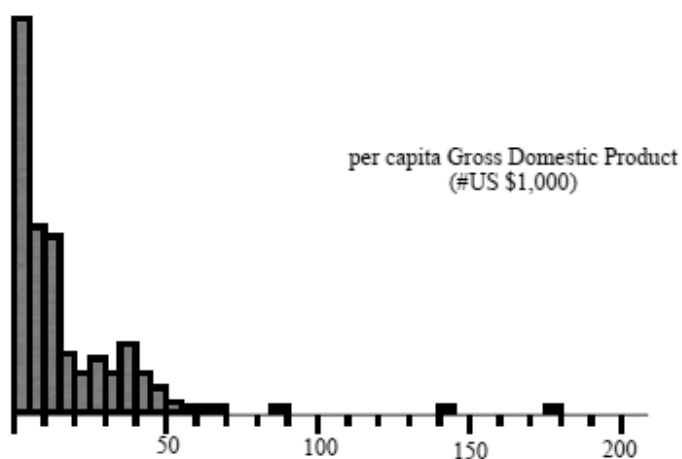
## Chapter 1: Drawing Statistical Conclusions

### 1.16 Gross Domestic Product (GDP) Per Capita.

a



c

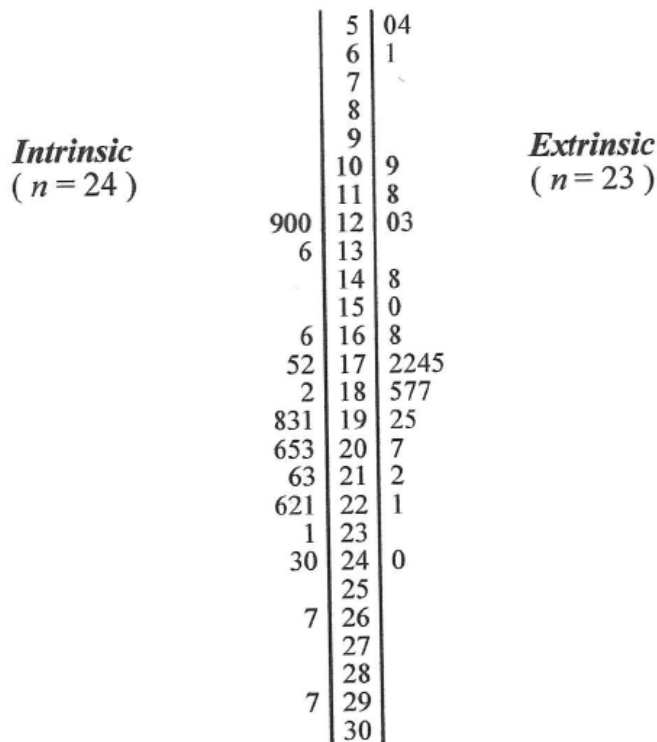


- 1.17** The difference between averages ( $A - B$ ) in the observed outcome is  $78.00 - 62.67 = +15.33$  points. In the list that follows, there are three outcomes (nos. 1, 34, and 35) that have a difference as large or larger in magnitude as the observed difference. The two-sided  $p$ -value is therefore  $3/35 = 0.0857$ .

<u>Outcome No.</u>	<u>Guide A</u>	<u>A Average</u>	<u>Guide B</u>	<u>B Average</u>	<u>(A - B) Difference</u>
1	53, 64, 68, 71	64.00	77, 82, 85	81.33	-17.33
2	53, 64, 68, 77	65.50	71, 82, 85	79.33	-13.83
3	53, 64, 68, 82	66.75	71, 77, 85	77.67	-10.92
4	53, 64, 68, 85	67.50	71, 77, 82	76.67	-9.17
5	53, 64, 71, 77	66.25	68, 82, 85	78.33	-12.08
6	53, 64, 71, 82	67.50	68, 77, 85	76.67	-9.17
7	53, 64, 71, 85	68.25	68, 77, 82	75.67	-7.42
8	53, 64, 77, 82	69.00	68, 71, 85	74.67	-5.67
9	53, 64, 77, 85	69.75	68, 71, 82	73.67	-3.92
10	53, 64, 82, 85	71.00	68, 71, 77	72.00	-1.00
11	53, 68, 71, 77	67.25	64, 82, 85	77.00	-9.75
12	53, 68, 71, 82	68.50	64, 77, 85	75.33	-6.83
13	53, 68, 71, 85	69.25	64, 77, 82	74.33	-5.08
14	53, 68, 77, 82	70.00	64, 71, 85	73.33	-3.33
15	53, 68, 77, 85	70.75	64, 71, 82	72.33	-1.58
16	53, 68, 82, 85	72.00	64, 71, 77	70.67	+1.33
17	53, 71, 77, 82	70.75	64, 68, 85	72.33	-1.58
18	53, 71, 77, 85	71.50	64, 68, 82	71.33	+0.17
19	53, 71, 82, 85	72.75	64, 68, 77	69.67	+3.08
20	53, 77, 82, 85	74.25	64, 68, 71	67.67	+6.58
21	64, 68, 71, 77	70.00	53, 82, 85	73.33	-3.33
22	64, 68, 71, 82	71.25	53, 77, 85	71.67	-0.42
23	64, 68, 71, 85	72.00	53, 77, 82	70.67	+1.33
24	64, 68, 77, 82	72.75	53, 71, 85	69.67	+3.08
25	64, 68, 77, 85	73.50	53, 71, 82	68.67	+4.83
26	64, 68, 82, 85	74.75	53, 71, 77	67.00	+7.75
27	64, 71, 77, 82	73.50	53, 68, 85	68.67	+4.83
28	64, 71, 77, 85	74.25	53, 68, 82	67.67	+6.58
29	64, 71, 82, 85	75.50	53, 68, 77	66.00	+9.50
30	64, 77, 82, 85	77.00	53, 68, 71	64.00	+13.00
31	68, 71, 77, 82	74.50	53, 64, 85	67.33	+7.17
32	68, 71, 77, 85	75.25	53, 64, 82	66.33	+8.92
33	68, 71, 82, 85	76.50	53, 64, 77	64.67	+11.83
34	68, 77, 82, 85	78.00	53, 64, 71	62.67	+15.33
35	71, 77, 82, 85	78.75	53, 64, 68	61.67	+17.08

- 1.18** Outcomes will vary with different randomizations. See text Display 1.7
- 1.19** Coin flips will not divide the subjects in such a way that there is an exact age balance. However, it is impossible to tell prior to the flips which group will have a higher average age.
- 1.20** The randomization scheme suggested in problem 18 works. So would dealing five red and five black cards after shuffling. Once again it will not guarantee an exact age balance, but the group that gets the higher average is not predictable in advance of the randomization.
- 1.21** There is no computation involved. This is, however, a sobering exercise.

1.22

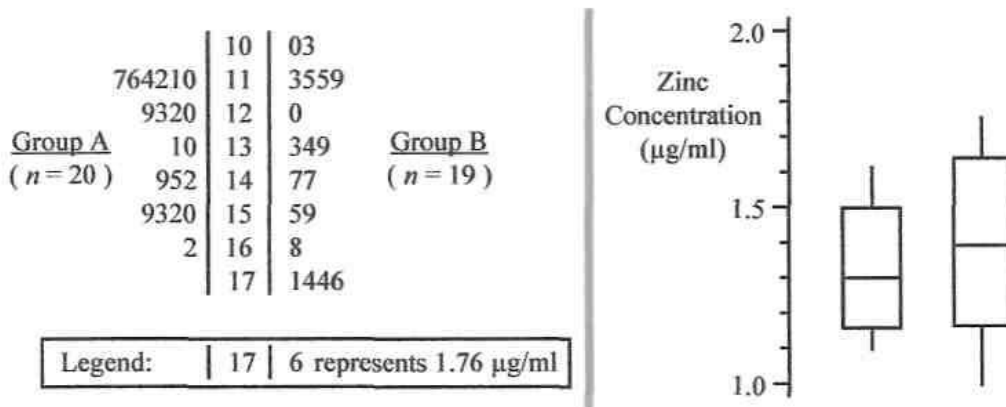


Legend: | 29 | 7 represents a creativity score of 29.7

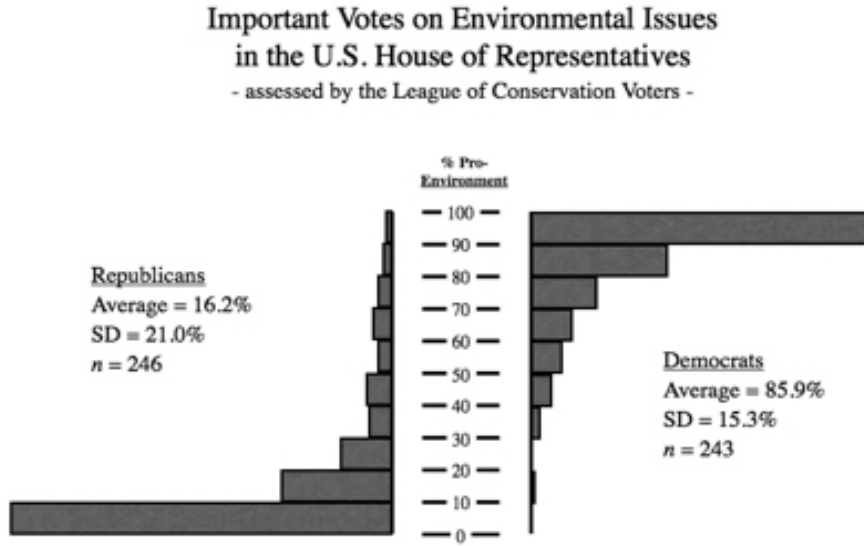
1.23 The box plot should look a bit like the stem and leaf diagram in exercise #22.

1.24 (Int,Ext): Medians are (20.4,17.2); Lower quartiles are (17.35, 12.0); Upper quartiles are (22.4, 19.2); IQRs are (5.05,7.2). There are no extreme points in either group.

1.25



1.26 Any picture tells the story. There is no need for a statistical test.



1.27 Again, any picture tells the story. There is no need for a statistical test.

