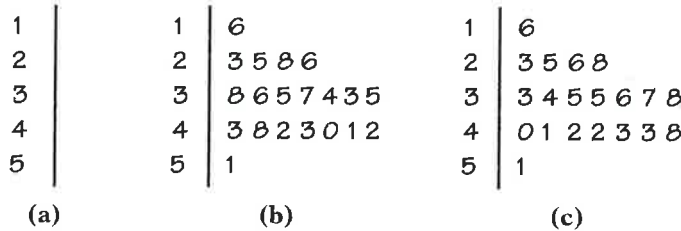*Homework 2* (handwritten)

Example: (handwritten)

1.10 Vitamin D. Your body needs vitamin D to use calcium when build-
ing bones. It is particularly important that young adolescents have adequate
supplies of this vitamin because their bodies are growing rapidly. Vitamin
D in the form 25 hydroxy vitamin D is measured in the blood and repre-
sents the stores available for the body to use. The units are nanograms per

milliliter (ng/ml) of blood. Here are some values measured on a sample of
20 adolescent girls aged 11 to 14 years:[3]

| 16 | 43 | 38 | 48 | 42 | 23 | 36 | 35 | 37 | 34 |
| 25 | 28 | 26 | 43 | 51 | 33 | 40 | 35 | 41 | 42 |

```
1            1 | 6            1 | 6
2            2 | 3 5 8 6      2 | 3 5 6 8
3            3 | 8 6 5 7 4 3 5  3 | 3 4 5 5 6 7 8
4            4 | 3 8 2 3 0 1 2  4 | 0 1 2 2 3 3 8
5            5 | 1            5 | 1

  (a)          (b)              (c)
```

FIGURE 1.6 Making a stemplot of the data in Example 1.10. (a) Write the stems. (b) Go
through the data and write each leaf on the proper stem. For example, the values on the 2 stem
are 23, 25, 28, and 26 in the order given in the display for the example. (c) Arrange the leaves
on each stem in order out from the stem. The 2 stem now has leaves 3, 5, 6, and 8.

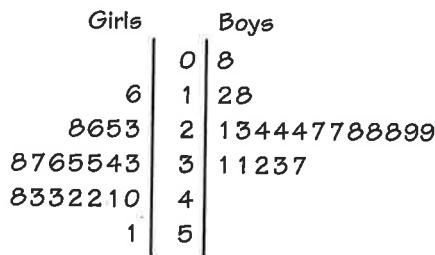*Problem:* (handwritten)

USE YOUR KNOWLEDGE

1.7 Make a stemplot. Here are the scores on the first exam in an introduc-
(a) tory statistics course for 30 students in one section of the course:

| 80 | 73 | 92 | 85 | 75 | 98 | 93 | 55 | 80 | 90 | 92 | 80 | 87 | 90 | 72 |
| 65 | 70 | 85 | 83 | 60 | 70 | 90 | 75 | 75 | 58 | 68 | 85 | 78 | 80 | 93 |

Use these data to make a stemplot. Then use the stemplot to describe
the distribution of the first-exam scores for this course.

Example: back to back: (handwritten)

```
        Girls        Boys
                0 | 8
            6   1 | 2 8
         8653   2 | 1 3 4 4 4 7 7 8 8 8 9 9
      8765543   3 | 1 1 2 3 7
      8332210   4 |
            1   5 |
```

FIGURE 1.7 A back-to-back stemplot to compare the distributions of vitamin D for samples of
adolescent girls and boys, for Example 1.11.

splitstems and
back to back

example:

FIGURE 1.8 A back-to-back stemplot with split stems to compare the distributions of vitamin D for samples of adolescent girls and boys, for Example 1.12.

Girls		Boys
	0	8
	1	2
6	1	8
3	2	13444
865	2	7788899
34	3	1123
87655	3	7
332210	4	
8	4	
1	5	

Problems:

USE YOUR KNOWLEDGE

1.8 Which stemplot do you prefer? Look carefully at the stemplots for the vitamin D data in Figures 1.7 and 1.8. Which do you prefer? Give reasons for your answer.

1.9 Why should you keep the space? Suppose that you had a data set for girls similar to the one given in Example 1.10, but that the observation of 23 ng/ml was changed to 25 ng/ml.

(a) Make a stemplot of these data for girls only using split stems.

(b) Should you use one stem or two stems for the 20s? Give a reason for your answer. (*Hint:* How would your choice reveal or conceal a potentially important characteristic of the data?)

1.33 Diabetes and glucose. People with diabetes must monitor and control their blood glucose level. The goal is to maintain "fasting plasma glucose" between about 90 and 130 milligrams per deciliter (mg/dl). Here are the fasting plasma glucose levels for 18 diabetics enrolled in a diabetes control class, five months after the end of the class:[17]

141	158	112	153	134	95	96	78	148
172	200	271	103	172	359	145	147	255

Make a stemplot of these data and describe the main features of the distribution. (You will want to trim and also split stems.) Are there outliers? How well is the group as a whole achieving the goal for controlling glucose levels? GLUCOSE

1.34 Compare glucose of instruction and control groups. The study described in the previous exercise also measured the fasting plasma glucose of 16 diabetics who were given individual instruction on diabetes control. Here are the data:

128	195	188	158	227	198	163	164
159	128	283	226	223	221	220	160

Make a back-to-back stemplot to compare the class and individual instruction groups. How do the distribution shapes and success in achieving the glucose control goal compare? GLUCOSE

1.7. Shown are two possible stemplots; the first uses split stems (described on page 11 of the text). The scores are slightly left-skewed; most range from 70 to the low 90s.

(b)
```
5 | 58
6 | 0
6 | 58
7 | 0023
7 | 5558
8 | 00003
8 | 5557
9 | 0002233
9 | 8
```

(a)
```
5 | 58
6 | 058
7 | 00235558
8 | 000035557
9 | 00022338
```

1.8. Preferences will vary. However, the stemplot in Figure 1.8 shows a bit more detail, which is useful for comparing the two distributions.

1.9. **(a)** The stemplot of the altered data is shown on the right. **(b)** Blank stems should always be retained (except at the beginning or end of the stemplot), because the gap in the distribution is an important piece of information about the data.

```
1 | 6
2 |
2 | 5568
3 | 34
3 | 55678
4 | 012233
4 | 8
5 | 1
```

1.33. Shown is the stemplot; as the text suggests, we have trimmed numbers (dropped the last digit) and split stems. 359 mg/dl appears to be an outlier. Overall, glucose levels are not under control: Only 4 of the 18 had levels in the desired range.

```
0 | 799
1 | 0134444
1 | 5577
2 | 0
2 | 57
3 |
3 | 5
```

1.34. The back-to-back stemplot on the right suggests that the individual-instruction group was more consistent (their numbers have less spread) but not more successful (only two had numbers in the desired range).

Individual		Class
	0	799
22	1	0134444
99866655	1	5577
22222	2	0
8	2	57
	3	
	3	5