

2.3 Stem-and-Leaf display

-Class = An interval in the data

ex: Between 40 and 50 miles.

-Class limit = the lowest and highest value that can fit in the class.

ex: 30 would be the lower class limit, and 40 would be the upper class limit.

-Class width = How wide the class is

ex: Upper class limit (40) minus lower class limit (30) = 10. then add 1 = 11

-Frequency = how many values from the data fall in the class.

ex: How many patients were transported 30 to 40 miles

Decide on Classes

- Classes should be the same width
- Class width can be determined empirically
 - Example: Age 18-24, 25-34, 35-44, 45-54, 55-64, 65 and older
 - Should be based on the scientific literature
- Can also be determined using a formula



Class Width Formula

Formula

- Calculate this number: maximum – minimum.
- Divide this by the number of classes desired.
- Increase this to the next whole number

Example

- From the miles, $47 - 1 = 46$.
- If we want 6 classes, $46/6 = 7.7$.
- We increase this up to 8

Simple Frequency Table

- A frequency table displays each *class* along with the *frequency* (number of data points) in each class.
- Selecting arbitrary class limits can make the frequency table unbalanced.
- But not following the scientific literature can make your results non-comparable

Class Limits (Lower-Upper)	Frequency
<20 miles	41
21-29 miles	10
30-39 miles	4
40 or more miles	5
Total	60

Relative Frequency Table

- “Relative” = in relationship to the rest of the data.
- Frequency = f
- Total sample size = n
- Relative frequency = f/n
- Relative frequency is the proportion of the values that are in that class.

Relative Frequency Table

- Relative frequency is something very useful to put in a frequency table.
- See how easy it is to calculate – take each class frequency divided by total.

Class Limits	Freq- uency	Relative Frequency
45 - 55	3	0.04
56 - 66	7	0.10
67 - 77	22	0.31
78 - 88	26	0.37
89 - 99	9	0.13
100 - 110	3	0.04
Total	70	1.00

Stem-and-Leaf

Building the Stem and Leaf

Stem

Days since referral

30	27	12	42	35	47
38	36	27	35	22	17
29	3	21	0	38	32
41	33	26	45	18	43
18	32	31	32	19	21
33	31	28	29	51	12
32	18	21	26	71	105

*Later, when we get to 51,
we will need to add a
5 to the stem.*

0 3 0
1 2 7
2 7 7 2 9 1
3 0 5 8 6 5
4 2 7
5 1 ←

Days since referral

30	27	12	42	35	47
38	36	27	35	22	17
29	3	21	0	38	32
41	33	26	45	18	43
18	32	31	32	19	21
33	31	28	29	51	12
32	18	21	26	71	105

Building the Stem and Leaf

0 3 0
1 2 7 At 105, the "10" is the stem.
2 7 7 2 9 1
3 0 5 8 6 5
4 2 7
5 1
6
7 1
8
9
10 5 ←

Days since referral

30	27	12	42	35	47
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29	3	21	0	38	32
41	33	26	45	18	43
18	32	31	32	19	21
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Reflection

Organizing Quantitative Data

Frequency Table

1. Need to set up classes, class widths
2. Need to count frequencies in each class
3. Lots of pre-calculations

Stem and Leaf

1. Do not need to set up classes or class widths
2. No need to count. Can tally the data as you go through the list.
3. Quicker to do