# 2.2 Graphing Quantitative Data - Histograms

**Ex** A survey of college students reveals the following raw data

**I** Raw Data

Hrs Listening to Spotify in one week

52, 18, 2, 20, 9, 9, 11, 6, 18, 16, 4, 12, 9, 16, 10, 37, 15
18, 8, 23, 4, 3, 17, 19, 12, 20, 11, 14, 10, 37, 21
36, 17, 3, 23, 28, 19, 20, 29, 12

17 + 14 + 9 = N = 40

**II** Frequency Table

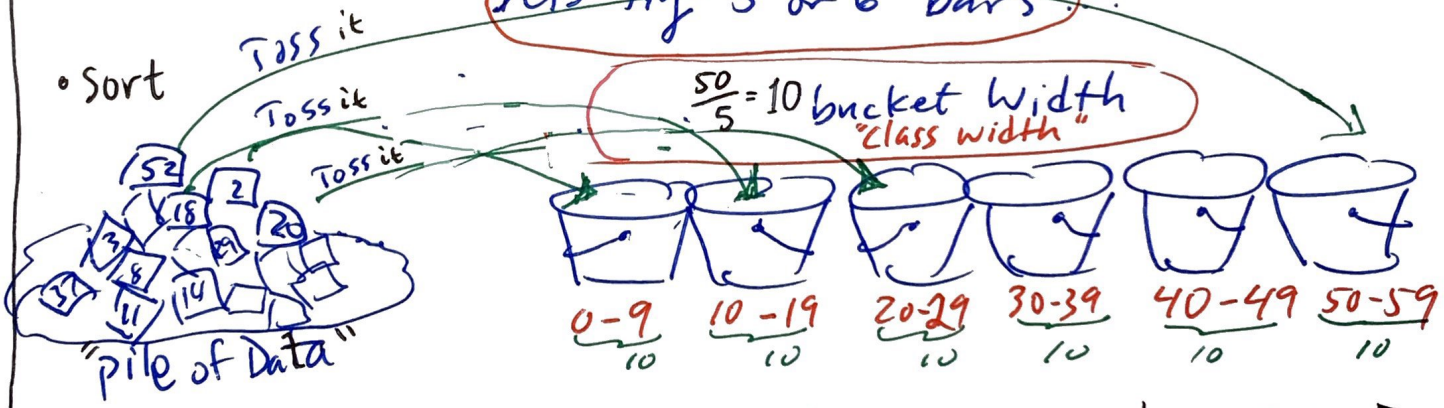
- max = 52
- min = 2
- range = max - min = 52 - 2 = 50
- Resolution: High Res. (10 bar) ⇒ Low Res. (2 bars)

- Decide on the number of bars:

Lets try 5 or 6 bars

$\frac{50}{5} = 10$ bucket Width "class width"

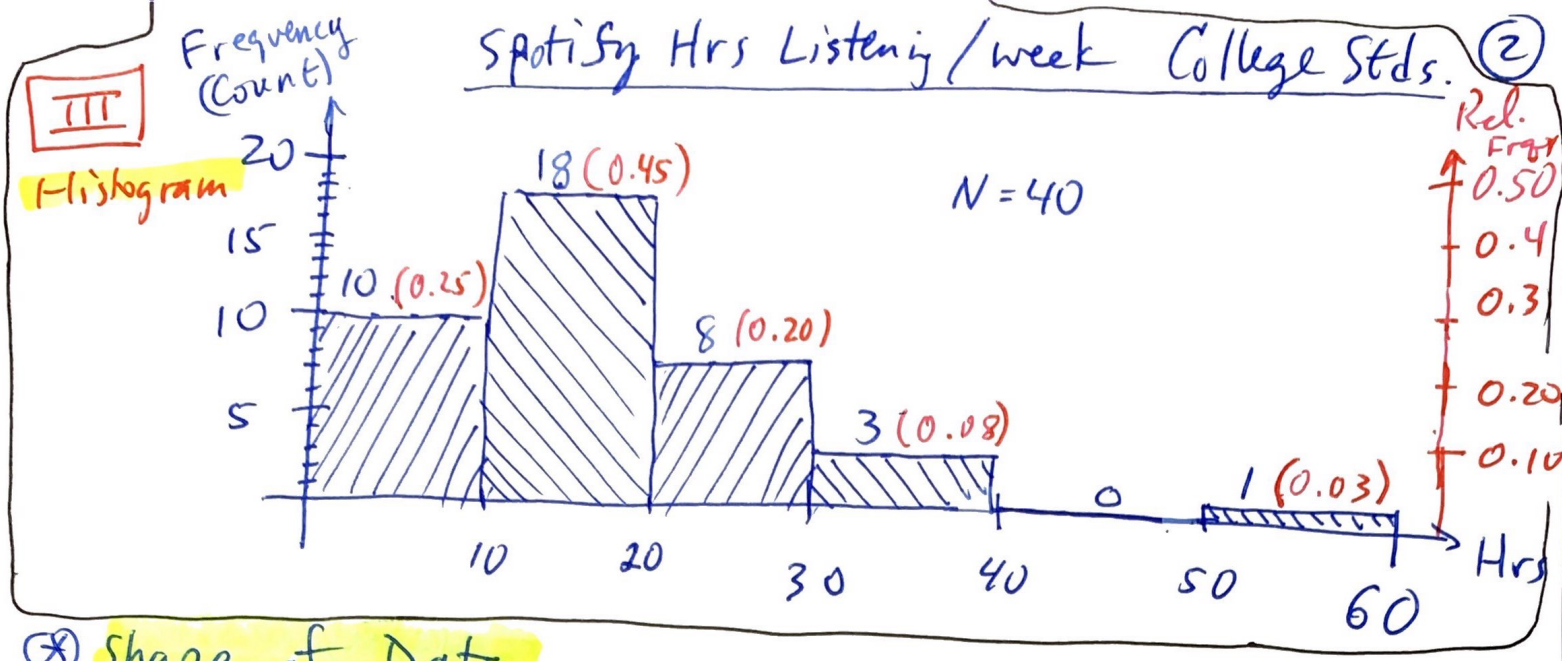
- Sort




| Class | Tally Space | Frequency | Rel. Freq. | |
|---|---|---|---|---|
| 0-9 | 𝍸 𝍸 | 10 | 10/40 = 0.25 | 90 |
| 10-19 | 𝍸 𝍸 𝍸 III | 18 | 18/40 = 0.45 | |
| 20-29 | 𝍸 III | 8 | 8/40 = 0.20 | |
| 30-39 | III | 3 | 3/40 = 0.075 | 10 |
| 40-49 | | 0 | 0.00 | |
| 50-59 | I | 1 | 1/40 = 0.025 | |
| | Total | 40 | 1.00 ✓ | |

Uniform and No-gap, No-overlaps.

Spotify Hrs Listening / week College Stds.




## ⊛ Shape of Data

- **modality** if our histogram has one large "bump" we say our data is

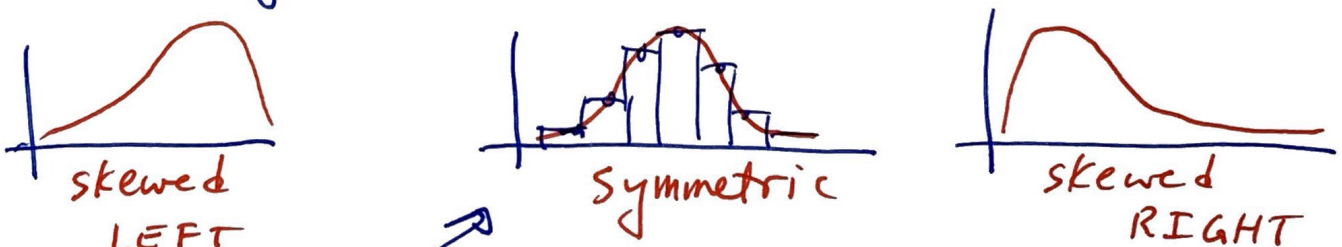
  **uni-modal**

  if our histogram has two prominent bumps we say the data is

  **bi-modal**

  if our histgram has more than two promenent bumps we say our data is **multi-modal**

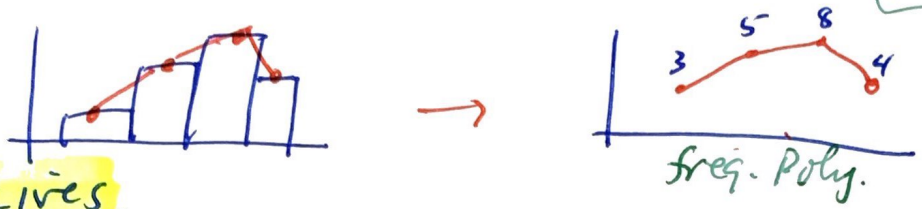
- **symmetry of the data**




Remember the curve is to be thought of as the tops of a histogram, we just don't take the time to draw bars.

## ✱ Frequency Polygon

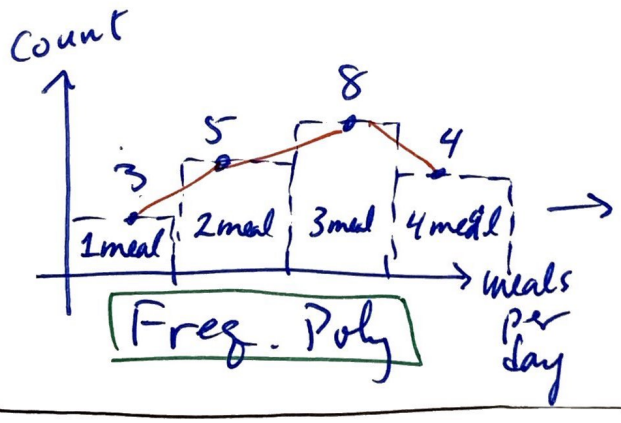
If we connect the center of the top bars of a histogram we have an **frequency Polygon**

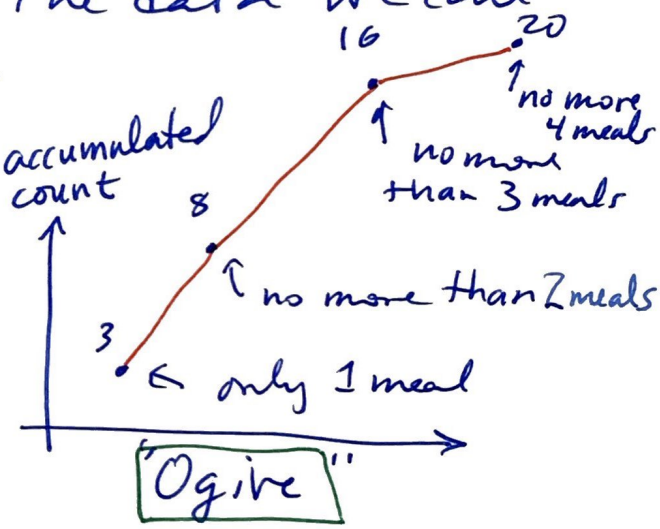



## ✱ Ogives

{ In aerospace a squashed cone is an ogive
The shape resembles an "almond" }

- When we accumulate the data we call such graphs ogives




**ex**

16 ppl, have No more than 3 meals/day

⊛ statdisk.com Make a histogram on computer. (4)

- enter raw data into Column 1 {not row 1} Hint: Use the down arrow
- Click on "Data"
  - ↳ Click on Histogram
- enter title & x & y label names if desired.
- try "auto fit" and also "user defined"
  - ↳ decide width
    decide start
- plot

play with the class width to get around 5 or 6 bars, if appropriate.