1 Introduction to Frequency Histograms

Let's begin by gathering data for a numerical variable. Copy and paste your data for the "Height" variable from our shared spreadsheet[1]. Copy only numerical values (not the title text).

[1] colostate-my.sharepoint.com/:x:/g/personal/jshrine_colostate_edu/EZAyJvIdrrVDkWq6b7qyztABC72OXclx7KEF4yUi9A9lnQ?e=tHenoi

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Enter the number of entries that are not blank: ☐

To construct a frequency histogram, we must first start with a **frequency table**. This is a table which counts the number of times the variable takes a value which is in a specified interval. The intervals are called **bins**, and have equal length. How many bins to use is generally a choice made by whomever is creating the table, but a general rule of thumb is that the number of bins should equal approximately the square root of the number of entries in your table. We've created the bins for you below, and used

$$\sqrt{} = NaN \approx NaN \text{ bins.}$$

Fill out the frequency table for your data below. Use the convention that if a value is on the boundary of two different bins, put it in the larger bin (the one with the larger end points). Note that if you've accounted for all of the values, the sum of all frequencies should be the total number of data values.

Bin	Frequency
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
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Sum of Frequencies	0 (This should equal)

A frequency histogram has been created below using your frequency table. Note that there is a bar associated to each bin, and the height of each bar corresponds to the frequency of that bin.

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2 Frequency Distributions Part 1

In your group, discuss the following questions.

- How would you describe the shape of the distribution for this variable?
- What do you think the shape tells us about student heights in our class?
- In what ways might the shape of a distribution be related to predicting the likelihood of a specific outcome? (e.g., If you had to guess the height of a randomly chosen student from our class, what would you guess?)

3 Building Frequency Histograms

Use the space below to construct the frequency table and frequency histogram for the remaining two variables from our shared spreadsheet[1] ("Number of Moves" and "Power Test Score"). For each frequency histogram, discuss the following questions in your group.

- How would you describe the shape of the distribution for this variable?
- What do you think the shape tells us about this variable's values for students in our class?

[1] colostate-my.sharepoint.com/:x:/g/personal/jshrine_colostate_edu/EZAyJvIdrrVDkWq6b7qyztABC72OXclx7KEF4yUi9A9lnQ?e=tHenoi

1. Number of Moves

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Enter the number of entries that are not blank: ☐

Fill out the frequency table for your data below. Use the convention that if a value is on the boundary of two different bins, put it in the larger bin (the one with the larger end points). Note that if you've accounted for all of the values, the sum of all frequencies should be the total number of data values.

Bin	Frequency
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
	☐
Sum of Frequencies	0 (This should equal)

A frequency histogram has been created below using your frequency table. Note that there is a bar associated to each bin, and the height of each bar corresponds to the frequency of that bin.

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4 Frequency Distributions Part 2

Below are frequency histograms of some common distributions. Use them to discuss the following questions in your group.

(a) Identify at least one example of a variable whose distribution would resemble the shape of each distribution below.

(b) For each distribution, where do you think the mean and median values for the variable would lie?

Figure: A histogram in which there are two distinct bins that have similar frequencies to each other, but are much higher than the frequencies of the other bins.

Figure: A histogram in which all bins have equal frequencies.

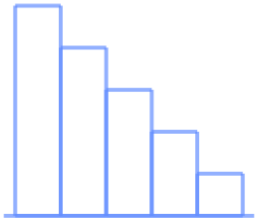

Figure: A histogram in which the frequencies of the bins decrease as you move from left to right.

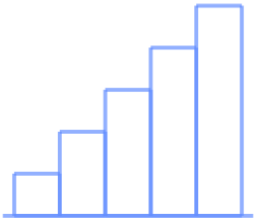

Figure: A histogram in which the frequencies of the bins increase as you move from left to right.

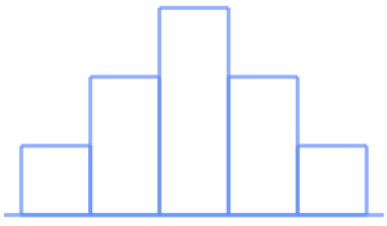

Figure: A histogram in which the middle bin has the highest frequency, and the frequencies of bins decrease symmetrically as you move away from the middle bin.

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