

Basic Probability (From Data)

Contingency Tables & Venn Diagrams

Vote with your feet (Four Corners)

- Are you a morning person?

Yes : Come to front of room.

No : Go to back of room

- Do you prefer chocolate to vanilla?

Yes : Go to left side of room (your left, my right)
but stay front (or back).

No : Go to right side (your right). Stay front (or back).

We can organize this information in a contingency table:

	Prefer Chocolate to Vanilla	Not Prefer Choc. to Vanilla	Totals
Morning Person			
Not a Morning Person			
Totals			

Calculate totals:

How many morning persons? ____ Not morning persons? ____

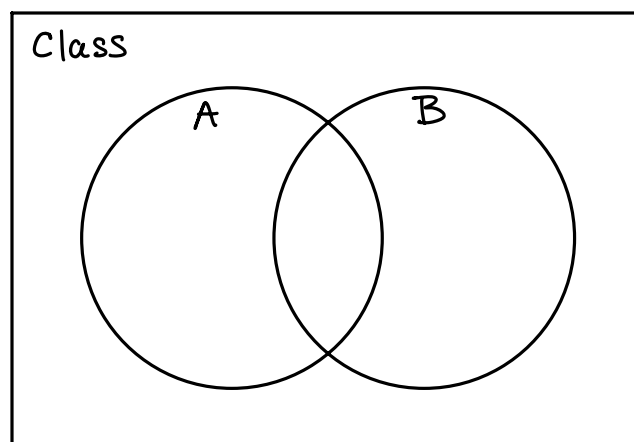
How many prefer chocolate? ____ Do not prefer choc? ____

How many in the class? ____

↳ Fill in the boxes in the table.

Vote with your feet (again)

- Start with everyone spread out along the walls of the classroom.
- Morning person : gather on right side of room
 - If you prefer choc., move towards center; if not move further right.
- Those of you who are not morning persons...
 - If you prefer choc., gather to the left, next to the morning persons who also prefer choc.



A : The set of people in this class who consider themselves morning persons.

B : The set of people in this class who prefer choc. to vanilla.

Another way to represent the same information.

Calculating Percentages

What percent of the class are morning persons? _____

How many morning persons prefer choc. to vanilla? _____

What percent of morning persons prefer choc. to vanilla? _____

- This is a _____ : only considering people in the class who are morning persons.

What percent of the class prefers choc. to vanilla? _____

What percent of those who prefer choc. to vanilla are morning persons? _____

What percent of the class are morning persons or prefer choc. to vanilla? _____

Which of the preceding four is conditional?

Empirical Probability

- also called experimental probability
- calculated from _____
- as opposed to _____ probability (next time)

Pick a student at random ("out of a hat"). What is the probability that the student:

- is a morning person? _____
- prefers choc. to vanilla? _____
- is a morning person and prefers choc. to vanilla? _____
- is a morning person or prefers choc. to vanilla? _____

Suppose that we pick a student randomly & after looking at the name, I tell you the student is a morning person. Given this information, what is the probability that the student prefers choc.? _____

Suppose, on the other hand, that I tell you the randomly picked student prefers choc. What is the probability that the student is a morning person? _____

These last two probabilities are _____.

Another Example. (Raise Hands)

- Born in Indiana or not?
- Prefer big cities (to great outdoors) or not?

1) Fill out the contingency table based on hands raised.

	Prefer Big Cities	Not Pref. Big Cities	Totals
Born in Indiana			
Not Born in Indiana			
Totals			

2) Draw a Venn diagram to summarize this information.

3) Were you born in Indiana? _____

How many people born in same place as you (in Indiana, if you were, not in Indiana if you weren't)? _____ %? _____

4) What is your preference, big cities or not? _____

How many ... with same preference? _____ %? _____

5) How many ... born where you were (Indiana or not) ...
AND same preference (cities or not)? _____ % ? _____

6) How many ... born where you were (Indiana or not) ...
OR same preference (cities or not)? _____ % ? _____

7) What percent of the people in this class who were born where
you were (Indiana or not) share your preference about cities
vs. the great outdoors? _____

8) What percent of the people in this class who share your
preference about cities vs. the great outdoors were born where
you were (Indiana or not)? _____

9) Write two conditional probability statements based on (7) and (8).

"The probability that a randomly selected student in the class
_____, given that he or she _____, is _____."

First Statement:

Second Statement: