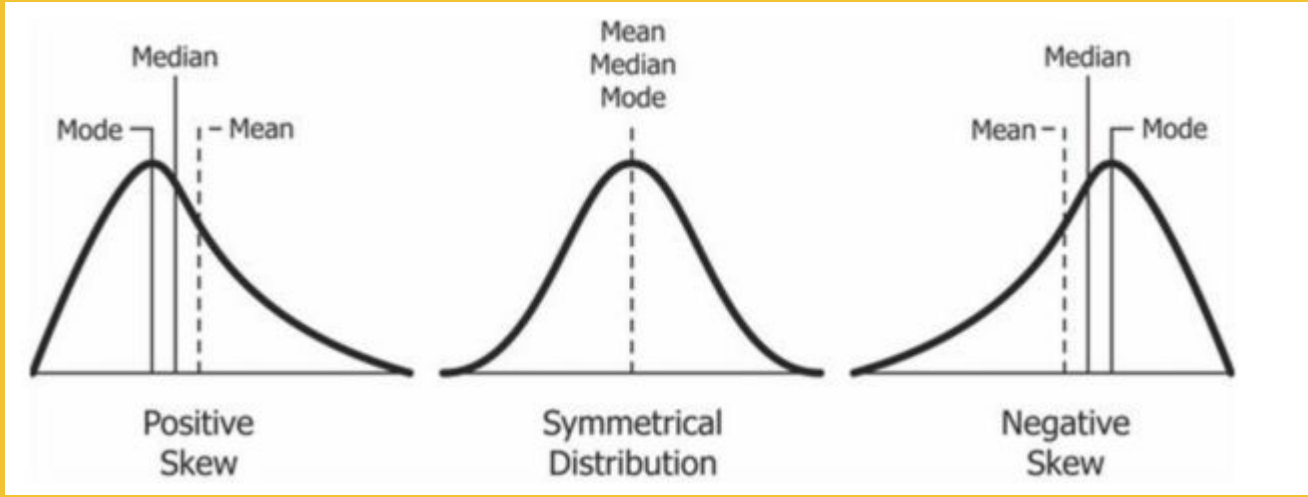


Econ 2250: Stats for Econ

Fall 2022

Source for pic stats above.

Announcements

- Homework is extended until Sunday
- Sample test will be available end of next week
- Class on next Friday will be async (virtual on Loom)

What we will do today?

- Unconditional probability rules
- Venn Diagrams
- Crosstab in Pandas

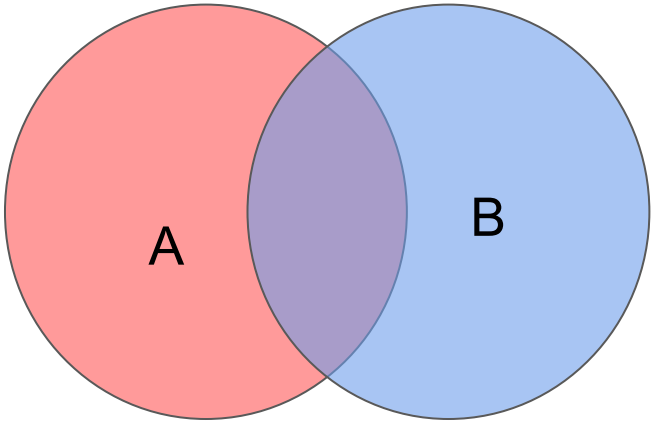
Basic Rules of Probability

1. For any event P(E) [0,1]
2. If an event cannot occur P(E) = 0
3. If an event is certain to occur P(E) =1
4. The sum of the probability of all outcomes must equal 1.

Likelihood of event

$$P(\text{event}) = \frac{\#\text{ of outcomes of event}}{\#\text{ of outcomes in } \Omega}$$

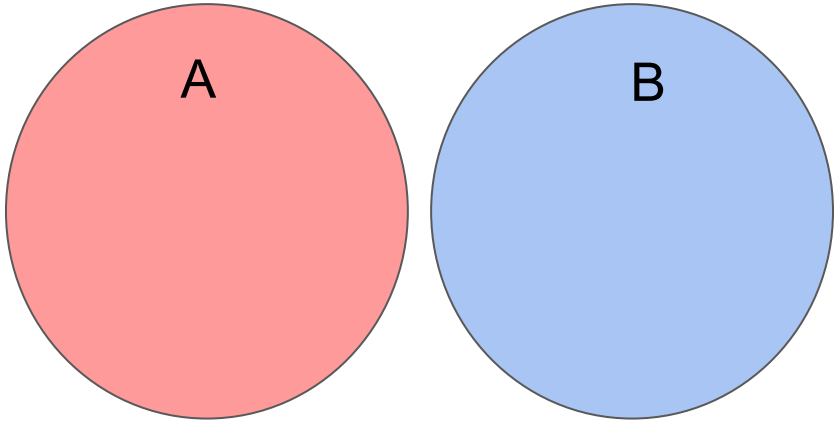
Non-mutually exclusive



P(A U B)

P(A) + P(B) - P(A|B)

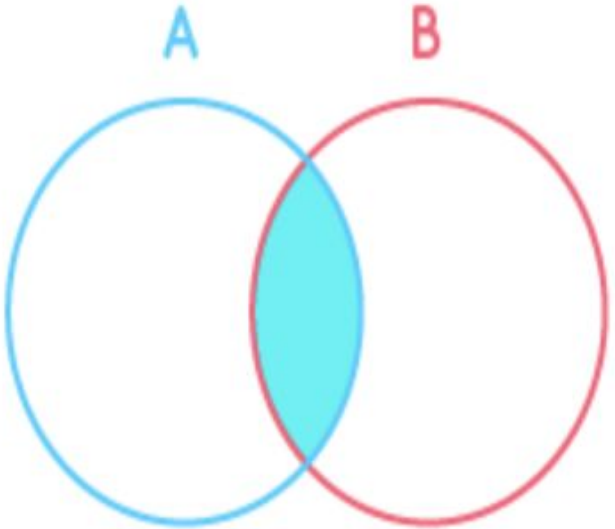
Mutually exclusive



P(A U B)

P(A) + P(B)

Independent



$$P(A \cap B)$$

P(A) * P(B)

Summary of probabilities

Event	Probability
A	$P(A) \in [0,1]$
not A	$P(A^\complement) = 1 - P(A)$
A or B	$P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = P(A) + P(B)$ if A and B are mutually exclusive
A and B	$P(A \cap B) = P(A\|B)P(B) = P(B\|A)P(A)$ $P(A \cap B) = P(A)P(B)$ if A and B are independent
A given B	$P(A \mid B) = \frac{P(A \cap B)}{P(B)} = \frac{P(B\|A)P(A)}{P(B)}$

End of class form

(https://forms.gle/A3DFr5VFJPqk9gtEA)