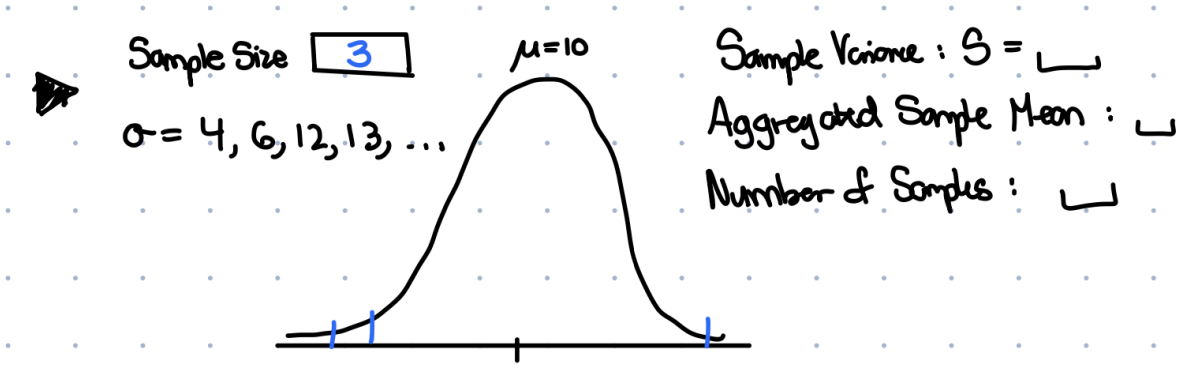
CSE 442 Final Project Outline

**Premise of the Central Limit Theorem:**

**Visualization**




- The user can pick a sample size and start the animation
- We will then sample from the distribution, compute the sample mean, and display them to the user
- As we take more samples, the sample variance, aggregated sample mean, and number of samples will increase
- Users should see that **a higher sample size leads to more accurate sample means, a smaller sample variance, and that it takes fewer # samples to get the aggregates sample mean ~ actual population mean**

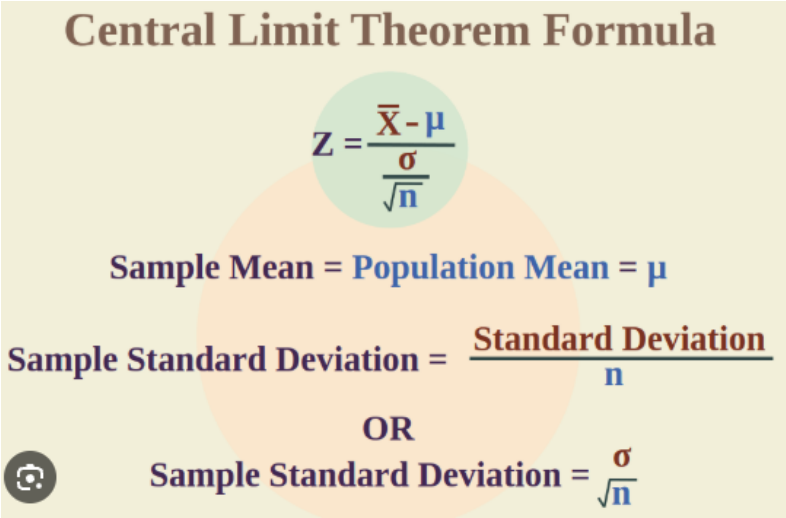
**Three Rules for the Central Limit Theorem:**

- All $X_i$'s are **independent** from each other
- Each $X_i$'s is drawn from the same distribution
- $0 < \text{Var}(X_i) < \infty$

- Idea: Have buttons that allows the user to turn each one off, and see that the distribution is not normal

- If possible, would be cool to have them turn them off, and dynamically draw a graph that breaks the central limit theorem

**Equation of the Central Limit Theorem:**




- User highlights a symbol, there is a definition of what the symbol represents

**Actual Simulation of the CLT**

- Give the user some choice in creating a distribution
- Can maybe choose from some non-normal distributions (think like Poisson or Uniform or something)
- And then have them press play, let the animation play, and construct the graph
    - Like sample, get the means, and plot them
    - Will show that over time, will look more normalized

**Summary**

**Citation/Sources:**


- https://pmc.ncbi.nlm.nih.gov/articles/PMC5370305/
- 3Blue1Brown