We've learned about continuous probability distribution, and quantities and properties regarding random variables. Can you identify what were the key concepts or terminology in this week?

List them and briefly explain**in your own words.**When you post, please avoid copying & pasting textbooks or internet diagrams, though you can keep it for your reference. If some concepts were unclear, you can explain what was confusing and post questions instead.

Or, if you're visual person, you're welcome to draw diagrams.

Share your ideas and comment to your classmates' ideas or questions.

We learned about continuous distributions; uniform, exponential and pareto.

**Uniform distribution**: Here I learned the tilde ~ means “is distributed as”. And, using it here for the definition of uniform distribution we can say that X ~ U(a,b) for b>a. The PDF is f(x) = 1/(b-a) for a<=x<=b. And the CDF for F(x) = (x-a)/(b-a) for a<=x<=b.

**Exponential distribution**: The exponential distribution occurs over positive real numbers (inclusive of zero). The highest density occurs at 0 and then it decays as x increases. The PDF for exponential distribution is f(x) = λe^(-λx) where the λ = the mean number of events in an interval and x = the random variable, and e is euler’s number.

**Pareto distribution**: The pareto distribution is X ~ f(a) where F(x) = *α / x^a+1* This is also commonly known as the “80-20 rule” and also has been used ot describe income inequality.

**Normal distribution**: A random variable with a Gaussian distribution is normally distributed. The density is defined by two parameters:

μ: the mean of the distribution

σ^z: the variance of the distribution where σ is the standard deviation

The probability density of the normal distribution is:

We also learned about **Q-Q plots**:

A quantile is a point where certain values fall below or above that point. For example, the median would be the point where 50% of the data lie above it, and 50% fall below it. The quantile-quantile plot is a graphing technique used to plot two quantiles against each other, and its used to see if two sets of data come from the same distribution. If the data fall on a roughly 45 degree angle, then we know that they come from a common distribution.

Then we learned about **Multivariate Continuous Distributions**:

The multivariate normal distribution is a distribution over a vector of values for x

Our learnings also focused on **Expectation and Variance**:

We learned about the expectation for distribution: Bernoulli

The expectation for distribution: Binomial.

We learned about the PMF for Binomial

We also learned about the **Coefficient of Variance**, and undefined expectations

We learned about the definition of Variance

The variance of a R.V.

We learned about the undefined means: Not every probability distribution will have a defined mean, variance, or higher order moment.

We learned about the COV is used to measure the degree of irregularity of a positive random variable. Where the COV of an exponential distribution is 1.

In this part, you can share your tips and/or reflection on your learning with your classmates. For example, if you find some concepts or particular assignment or contents/material difficult, you can share your experience. Or if you found some tips how to better approach some learning, you can share.

Also, if you have any feedback on the material of this course- e.g. lecture content, pace, etc, quizzes, homework, resources etc, or any feedback for me.