https://www.youtube.com/watch?v=JQc3yx0-Q9E&list=PLblh5JKOoLUK0FLuzwntyYI10UQFUhsY9&index=12&ab\_channel=StatQuestwithJoshStarmer

To get the probability of a number xx from a **normal distribution**, you typically use the **probability density function (PDF)** or the **cumulative distribution function (CDF)**.

**1. Probability Density Function (PDF)**

The **PDF** of a normal distribution is given by:

Where:

* μ\mu = Mean of the distribution
* σ\sigma = Standard deviation
* xx = The value you want to evaluate

This gives the relative likelihood of xx occurring but **not the actual probability** since the probability in a continuous distribution is calculated over an interval.

**Python Example (Using SciPy)**

from scipy.stats import norm

mu = 0 # Mean

sigma = 1 # Standard deviation

x = 1.5 # Value to evaluate

pdf\_value = norm.pdf(x, mu, sigma)

print(pdf\_value) # Probability density at x

**2. Cumulative Distribution Function (CDF) – this what you use to get the values for p-value**

The **CDF** gives the probability that a random variable XX is **less than or equal to** xx:

This is useful if you want to find the probability of **observing a value up to xx**.

**Python Example (Using SciPy)**

cdf\_value = norm.cdf(x, mu, sigma)

print(cdf\_value) # Probability P(X ≤ x)

To get the probability of a number lying in a specific range (a,b)(a, b):

a, b = -1, 1.5

probability = norm.cdf(b, mu, sigma) - norm.cdf(a, mu, sigma)

print(probability) # Probability of X being between -1 and 1.5

your lectures are not special and the P-value for this is < 0.000001. This means the p-value is so low that the null hypothesis must go. means we reject the null hypotheses. meaning these lectures are very good and rare and out if the distribution of normal lectures on the internet.