



SNS COLLEGE OF ENGINEERING

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DEPARTMENT OF MANAGEMENT STUDIES

COURSE NAME : 19BA106 FUNDAMENTALS OF DATA ANALYSIS

I YEAR /I SEMESTER

Unit 2 - SAMPLING AND ESTIMATION

Topic 2: FDA - CONFIDENCE INTERVAL FOR MEANS



CONFIDENCE INTERVAL

- A confidence interval, in statistics, refers to the probability that a population parameter will fall between a set of values for a certain proportion of times.
- Confidence intervals measure the degree of uncertainty or certainty in a sampling method.



CONFIDENCE INTERVAL

Example:-

- We measure the heights of **40** randomly chosen men, and get a mean height of **175cm**.
- We also know the standard deviation of men's heights is **20cm**.

That is number of observations **$n = 40$**

mean (**\bar{X}**) = **175**

standard deviation **$s = 20$**



CONFIDENCE INTERVAL

Step 2: decide what Confidence Interval we want: 95% or 99% are common choices.

Then find the "Z" value for that Confidence Interval here:

Confidence Interval	Z
80%	1.282
85%	1.440
90%	1.645
95%	1.960
99%	2.576
99.5%	2.807
99.9%	3.291



CONFIDENCE INTERVAL

For 95% the Z value is **1.960**

Step 3: use that Z value in this formula for the Confidence Interval

$$\bar{X} \pm Z(s / \sqrt{n})$$

Where:

\bar{X} is the mean

Z is the chosen Z-value from the table above

s is the standard deviation

n is the number of observations



CONFIDENCE INTERVAL

And we have:

$$175 \pm 1.960 \times 20\sqrt{40}$$

Which is:

$$175\text{cm} \pm 6.20\text{cm}$$

In other words: from 168.8cm to 181.2cm





CONFIDENCE INTERVAL

- How do we know if the sample we took is one of the "lucky" 95% or the unlucky 5%?
- Unless we get to measure the whole population like above we simply **don't know**.



RECAP

QUESTIONS???

THANK YOU