DAILY ASSESSMENT

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Course:	Coursera	USN:	4AL17EC070
Topic:	Basic Statics	Semester & Section:	6TH SEM & 'B' Section
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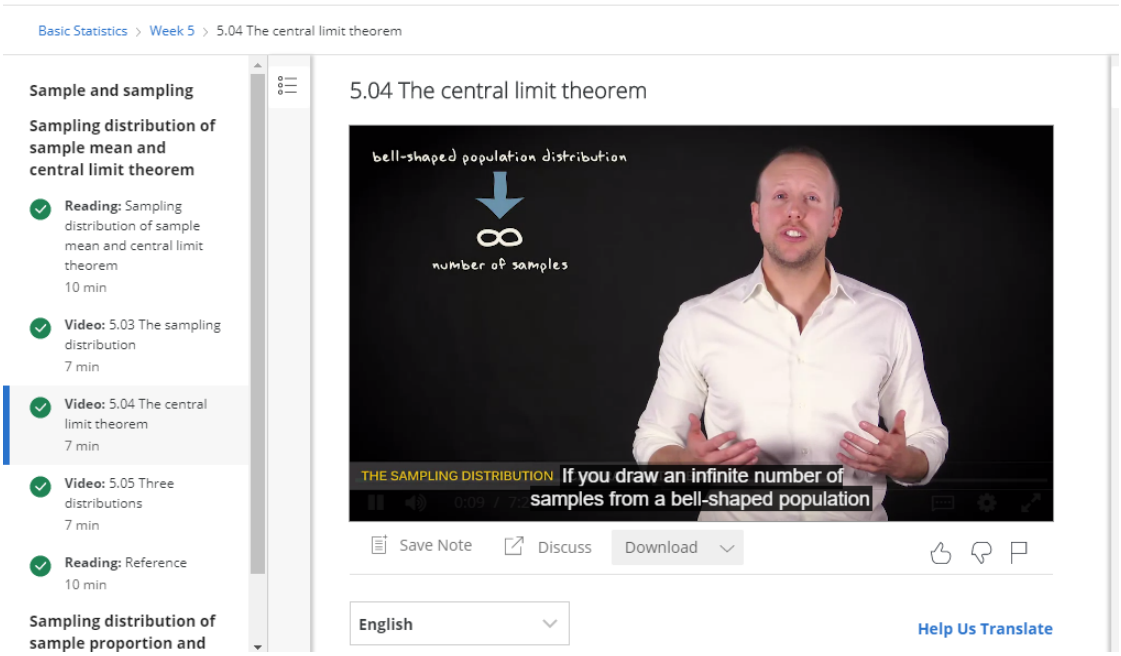
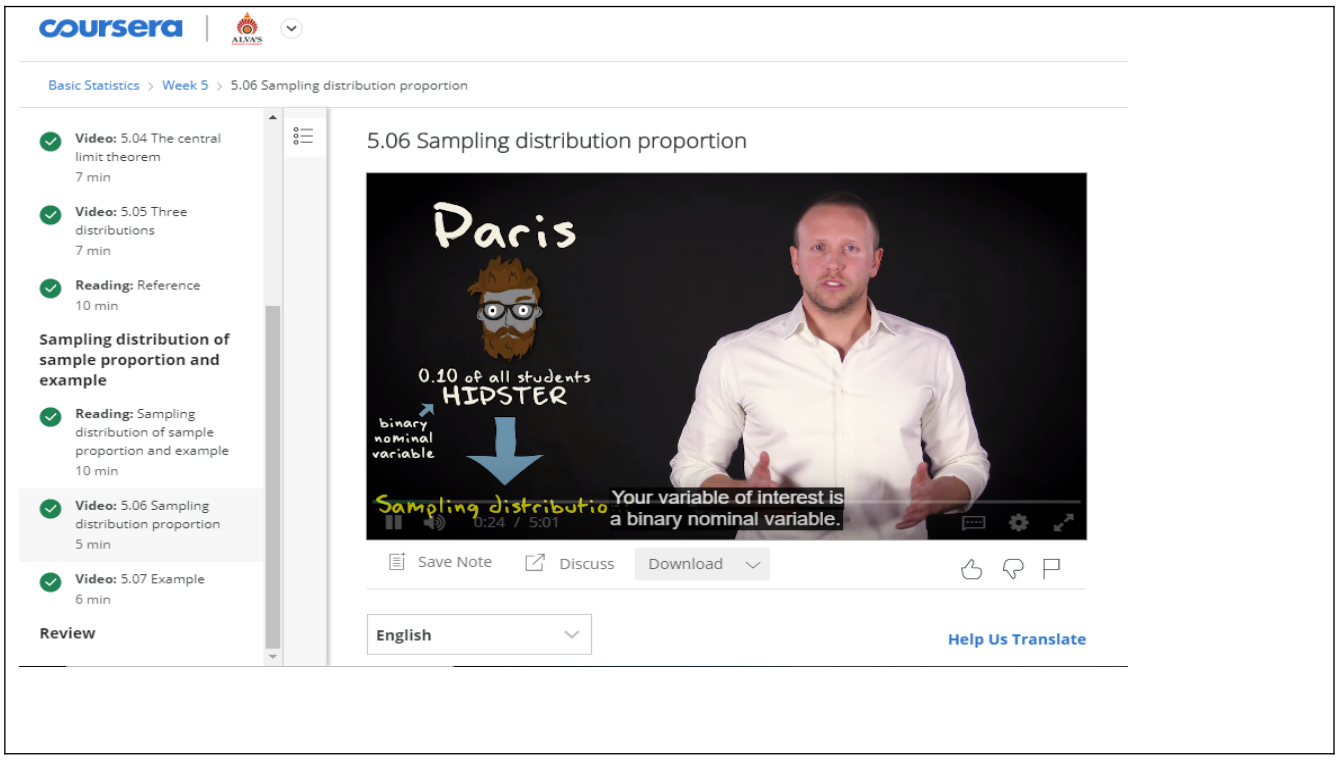
SESSION DETAILS





Sample and Population

200 students
↓
COMPUTATIONS
univariat analys — bivariat analys
mode, means, standard deviation
Pearson's R, regression analys
↓
numerical summaries
statistics

sample ——————→ Population
↓
Statistics — Inferential statistics → Parameter
↓ ↓
Roman letters — Greek letter
$\bar{x}$ = mean — μ = mean
s = SD in sample — σ = SD in population

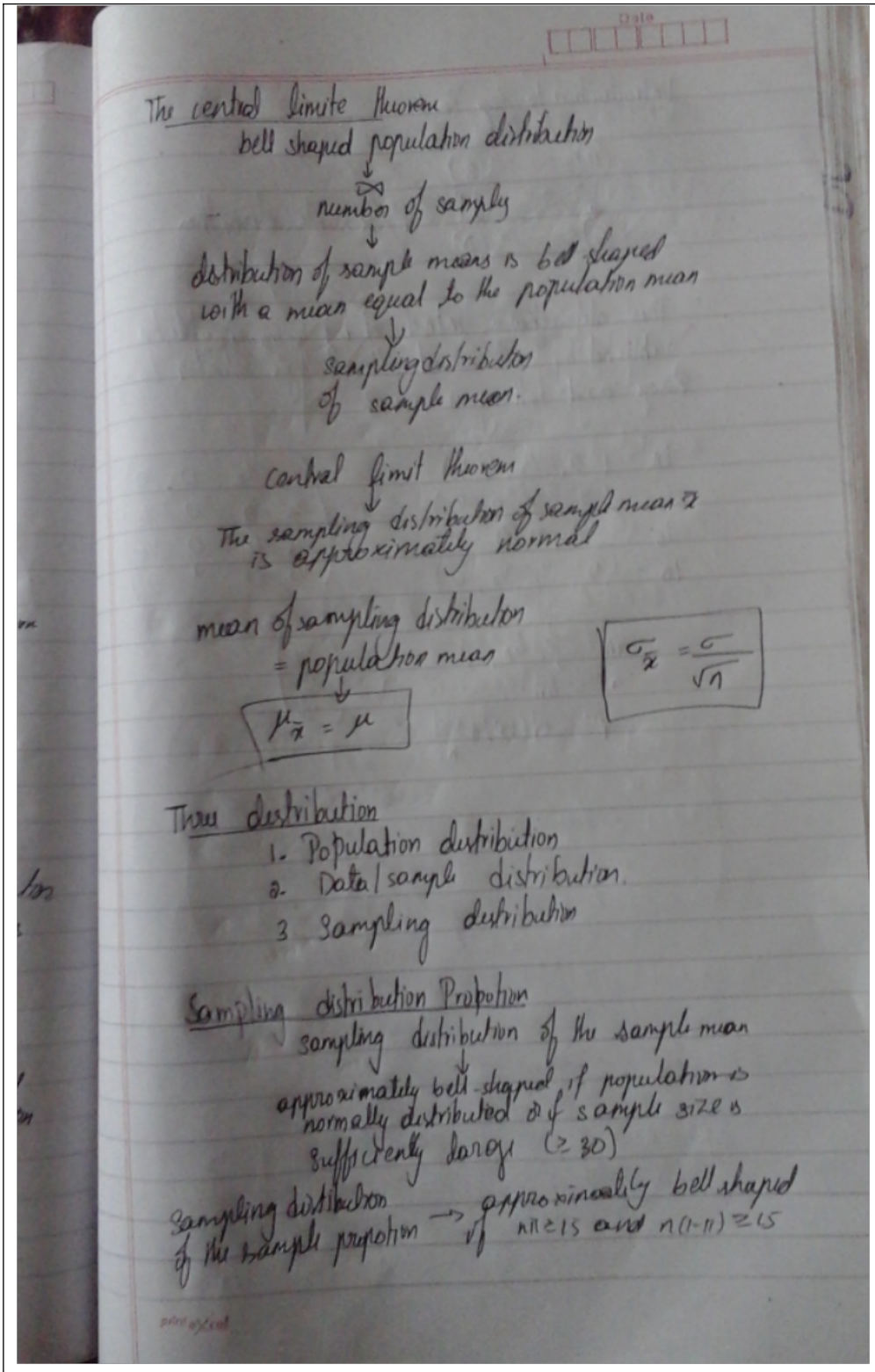
Sampling

Inferential statistics refers to method used to draw conclusion about a population, based on data coming from a sample

A sample is nothing more than a subset of a population yet for methods of inferential statics, not sample is appropriate

The sampling distribution

Sample distribution is the link that helps researchers to draw conclusions about a population on the basis of only one sample



The central limite theorem

bell shaped population distribution

↓

number of samples

↓

distribution of sample means is bell shaped with a mean equal to the population mean

↓

sampling distribution of sample mean.

Central limit theorem

↓

The sampling distribution of sample mean $\bar{x}$ is approximately normal

mean of sampling distribution = population mean

↓

$\mu_{\bar{x}} = \mu$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

Three distribution

1. Population distribution
2. Data/sample distribution.
3. Sampling distribution

Sampling distribution Proportion

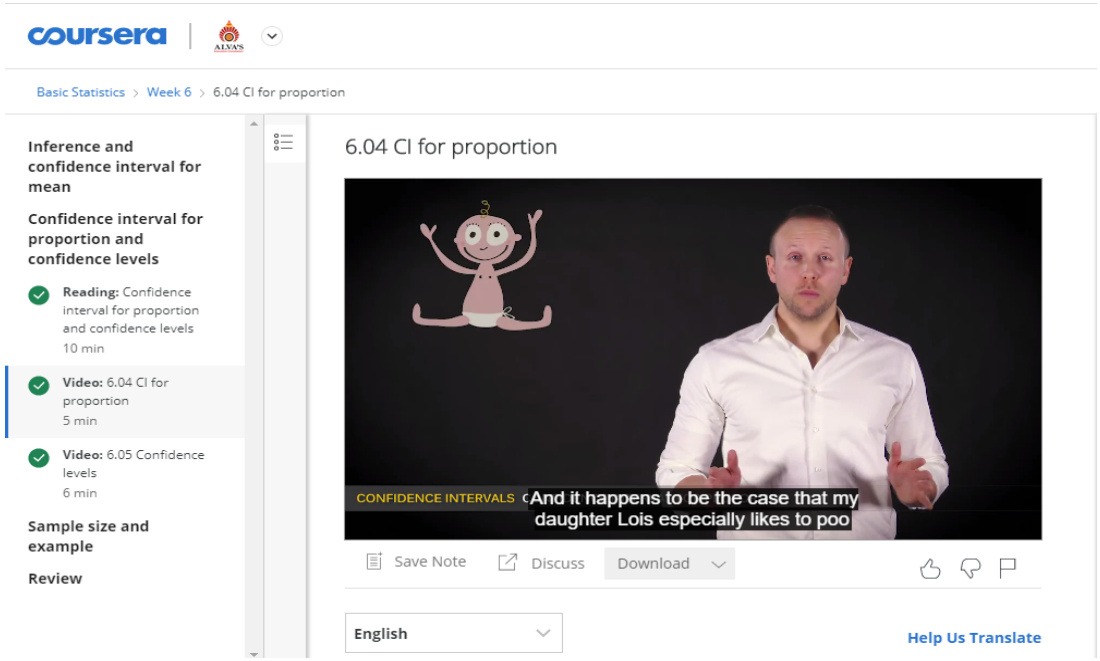
sampling distribution of the sample mean

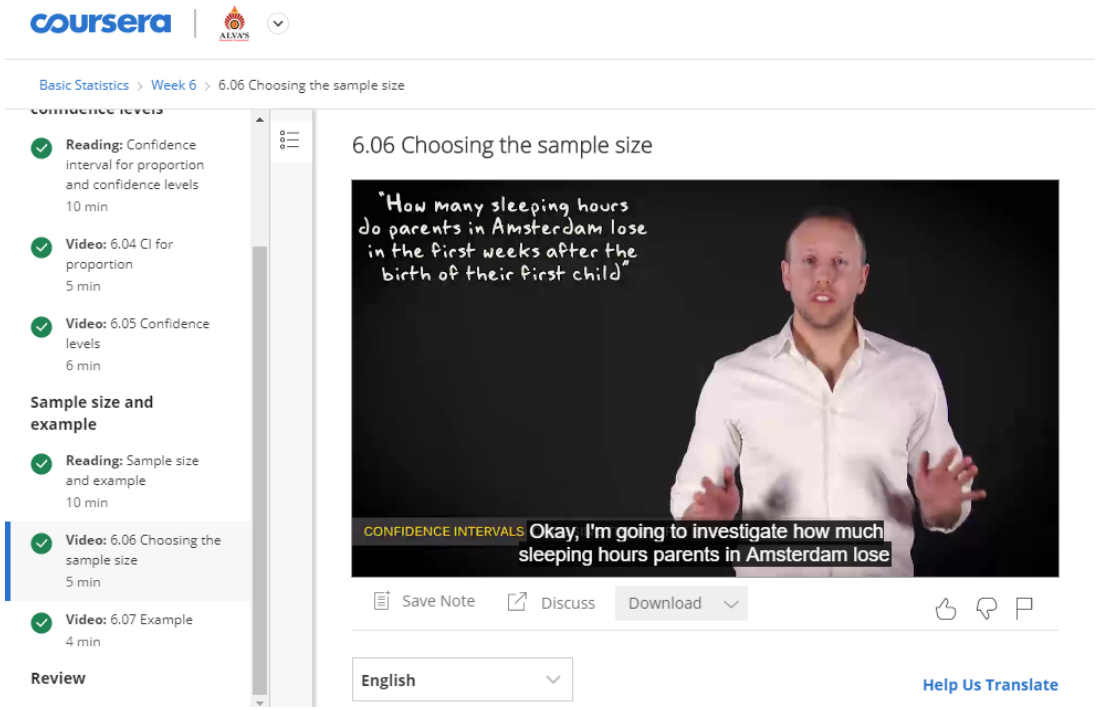
↓

approximately bell-shaped if population is normally distributed & if sample size is sufficiently large (≥ 30)

Sampling distribution of the sample proportion → approximately bell shaped if $np \geq 15$ and $n(1-p) \geq 15$

SESSION DETAILS



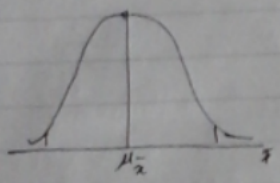


Statistical Inference

Statistical inference

- Estimation
  - Point estimation
  - Interval estimation
- Hypothesis testing

Confidence interval



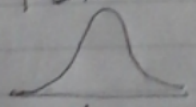
$\mu_{\bar{x}} = \mu$

$\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

Confidence interval
↓
estimate a population mean
↓
in 95% of the samples the population value will fall within the confidence interval $\bar{x} \pm 1.96\sigma_{\bar{x}}$

where $\sigma_{\bar{x}} = \frac{\sigma}{\sqrt{n}}$

T distribution



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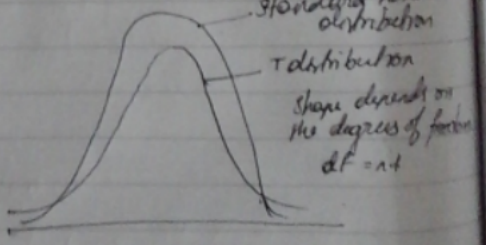
Bell shaped symmetric
@ mean of zero
takes into account



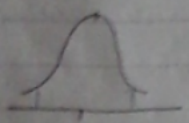
Assumption

1. Randomization
2. approximately normal population distribution

6.1 for proportion

confidence interval for a proportion

sampling distribution of the sample proportion



$\mu_p = \pi$

$\sigma_p = \sqrt{\frac{\pi(1-\pi)}{n}}$

$p \pm 1.96\sigma_p \quad \sigma_p = \sqrt{\frac{\pi(1-\pi)}{n}}$

$p \pm Z_{95\%}(se)$

$se = \sqrt{\frac{p(1-p)}{n}}$

Using the Sample Size

Sample size means

1 magnitude of desired margin of error

2 confidence level

3 variability

$n = \frac{\sigma^2 Z^2}{m^2}$

Sample size proportion

$n = \frac{p(1-p)Z^2}{m^2}$