Vision of the Department

To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

Mission of the Department

To establish learning ambience for ushering in computer engineering professionals in core and multidisciplinary area by developing Problem-solving skills through emerging technologies.

Session 2025-2026

Vision: To apply statistical estimation techniques for real-world data analysis, enabling students to understand how sample data can be used to make reliable inferences about population parameters.	**Mission:** To analyze the student height data from the survey dataset by: 1. Computing the **point estimate** (mean height). 2. Constructing a **confidence interval** without assuming population standard deviation. 3. Enhancing practical understanding of hypothesis testing, estimation, and data-driven decision-making.

Program Educational Objectives of the program (PEO): (broad statements that describe the professional and career accomplishments)

PEO1	**Preparation**	**P: Preparation**	**Pep-CL abbreviation pronounce as Pep-si-lL easy to recall**
PEO2	**Core Competence**	**E: Environment (Learning Environment)**	
PEO3	**Breadth**	**P: Professionalism**	
PEO4	**Professionalism**	**C: Core Competence**	
PEO5	**Learning Environment**	**L: Breadth (Learning in diverse areas)**	

Program Outcomes (PO): (statements that describe what a student should be able to do and know by the end of a program)

Keywords of POs:
Engineering knowledge, Problem analysis, Design/development of solutions, Conduct Investigations of Complex Problems, Engineering Tool Usage, The Engineer and The World, Ethics, Individual and Collaborative Team work, Communication, Project Management and Finance, Life-Long Learning

PSO Keywords: Cutting edge technologies, Research

"I am an engineer, and I know how to apply engineering knowledge to investigate, analyse and design solutions to complex problems using tools for entire world following all ethics in a collaborative way with proper management skills throughout my life." *to contribute to the development of cutting-edge technologies and Research*.

Integrity: I will adhere to the Laboratory Code of Conduct and ethics in its entirety.

Name and Signature of Student and Date
(Signature and Date in Handwritten)

Session	2024-25 (ODD)	Course Name	Computer Workshop Lab
Semester	5	Course Code	23IOT1526
Roll No	42	Name of Student	Karan Chopkar

Practical Number	**3**
Course Outcome	1. Understand the fundamentals of computer hardware and working of Linux operating system 2. Use Linux commands to manage files and file systems 3. Execute Scripts 4. Debug Programs on various IDEs
Aim	To analyze the data to find out the estimated value. Use a built-in data frame named survey. The dataset belongs to the mass, which has to be preloaded into the R workspace prior to use.
Problem Definition	(a) Find a point estimate of mean university student height with the sample data from the survey. (b) Without assuming the population standard deviation of the student height in the survey, find the margin of error and interval estimate at a 95% confidence level.
Theory (100 words)	Point estimation is a technique used to find the estimate or approximate value of population parameters from a given data sample of the population. The point estimate of a population mean -Point estimation of population mean can be calculated by using mean() function in R. The syntax is given below, Syntax: mean(x, trim = 0, na.rm = FALSE, …) Here, • x: It is the input vector • trim: It is used to drop some observations from both end of the sorted vector

	• na.rm: It is used to remove the missing values from the input vector. **Margin of error:** A margin of error tells you how many percentages points our results differ from the real value. The margin of error is defined as the range of values below and above the sample statistic in a confidence interval. The confidence interval is a way to show what the uncertainty is with a certain statistic. The higher the margin of error, the lesser the chances of relying upon the results of the survey. If the margin of error is low, it means that the results obtained from the sample are highly reliable and will be very close to the ones obtained when surveying the complete population. In terms of sample size, the formula is given by, M.O.E. = 1 / √(n) **Interval estimate:** An interval estimate, in statistics, is a range of values used to estimate a population parameter. Unlike point estimates, which provide a single value as an estimate, interval estimates acknowledge the uncertainty inherent in statistical sampling and provide a range within which the true parameter is likely to fall. The most common form of interval estimate is the confidence interval. **Confidence interval:** The confidence level describes the uncertainty associated with a sampling method. Suppose we used the same sampling method (say sample mean) to compute a different interval estimate for each sample. Some interval estimates would include the true population parameter and some would not. A 90% confidence level means that we would expect 90% of the interval estimates to include the population parameter. A 95% confidence level means that 95% of the intervals would include the population parameter.

<table>
<tr><td rowspan="3">Procedure and Execution

(100 Words)</td><td>Steps for implementation:
1. Load MASS package and survey dataset.
2. Calculate sample mean of Height.
3. Find sample size and standard deviation.
4. Get t-value for 95% CI.
5. Compute Margin of Error = t × (SD / √n).
6. Calculate CI = mean ± ME.
7. Display results.</td></tr>
<tr><td>Code:
library(MASS)
str(survey)

height_data<-survey$Height
mean_height<-mean(height_data, na.rm = TRUE)
print(mean_height)

standard_error<-sd(height_data, na.rm = TRUE)/sqrt(length(height_data))
print(standard_error)

df <- n - 1
m_o_e<-qt(0.95, df = length(height_data)-1)*standard_error
print(m_o_e)

upper_bound<- mean_height + m_o_e
lower_bound<- mean_height - m_o_e
cat("Lower Bound:", lower_bound)
cat("Upper Bound:", upper_bound)</td></tr>
<tr><td>Output:</td></tr>
</table>

PRAC1.r | PRAC1B.r | PRAC2.r | PRAC1B.r | PRAC3.r

Source on Save | Run | Source

```r
library(MASS)
str(survey)

height_data<-survey$Height
mean_height<-mean(height_data, na.rm = TRUE)
print(mean_height)

standard_error<-sd(height_data, na.rm = TRUE)/sqrt(length(height_data))
print(standard_error)

df <- n - 1
m_o_e<-qt(0.95, df = length(height_data)-1)*standard_error
print(m_o_e)

upper_bound<- mean_height + m_o_e
lower_bound<- mean_height - m_o_e
cat("Lower Bound:", lower_bound)
cat("Upper Bound:", upper_bound)

```

19:1 (Top Level) R Script

Console | Terminal | Background Jobs

R 4.5.1 · ~/

```
> print(mean_height)
[1] 172.3809
> standard_error<-sd(height_data, na.rm = TRUE)/sqrt(length(height_data))
> print(standard_error)
[1] 0.6396657
> df <- n - 1
> m_o_e<-qt(0.95, df = length(height_data)-1)*standard_error
> print(m_o_e)
[1] 1.056303
> upper_bound<- mean_height + m_o_e
> lower_bound<- mean_height - m_o_e
> cat("Lower Bound:", lower_bound)
Lower Bound: 171.3246
> cat("Upper Bound:", upper_bound)
Upper Bound: 173.4372
>
```

Output Analysis	1. Point Estimate → Shows the average height of students in the sample. 2. Margin of Error → Maximum expected difference between sample mean and true population mean at 95% confidence. 3. 95% Confidence Interval → Range within which the true average student height is likely to fall with 95% certainty.
Link of student Github profile where lab assignment has been uploaded	https://github.com/karan-0123/MFDA-Lab
Conclusion	Hence analyzed the data to find out the estimated value.

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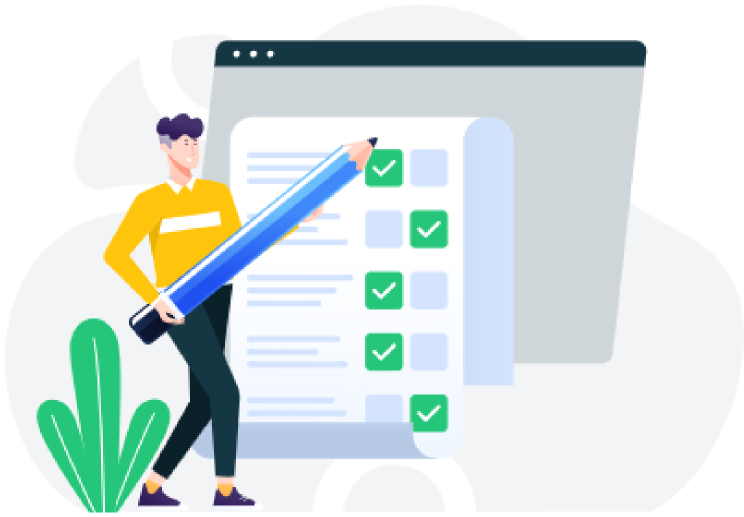
Plag Report (Similarity index < 12%)	 Unique 100% Exact 0% Partial 0% **View Plagiarized Sources**  Congratulations Plagiarism not found!
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