

**Department of Artificial Intelligence & Data Science****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:** Dream of where you want.**Mission:** Means to achieve Vision**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-IL 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)



Department of Artificial Intelligence & Data Science

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	2025-26 (ODD)	Course Name	BDH Lab
Semester	7 AIDS	Course Code	22ADS703
Roll No	21	Name of Student	Sanskriti.Paunikar

Practical Number	9
Course Outcome	CO1:- 1. Understand big data analytics and its business applications. CO2:- Analyze the HADOOP and Map Reduce technologies associated with big data analytics. CO3:- Apply Big Data analytics Using Pig and Hive.
Aim	Analyzing Various Data Visualization Methods Using R
Problem Definition	
Theory (100 words)	R is a powerful statistical programming language widely used for data analysis and visualization. It provides numerous methods to graphically represent data, including bar charts, histograms, scatter plots, line charts, boxplots, and heatmaps, using base R functions or packages like ggplot2 and lattice. Visualization helps in identifying patterns, trends, outliers, and relationships in datasets. Interactive tools like plotly enhance exploration. By transforming raw data into visual formats, analysts can communicate insights effectively. R's visualization capabilities support both exploratory data analysis and presentation, making it essential for statistical modeling, reporting, and data-driven decision-making..
Procedure and Execution (100 Words)	Steps of Implementation:- 1. Load Dataset into R using `read.csv()` or similar functions. 2. Explore Data with `head()`, `summary()`, and `str()` to understand structure and variables. 3. Select Visualization Type based on data and analysis goal (e.g., bar chart, histogram, scatter plot, line chart, boxplot, heatmap). 4. Create Plot using base R (`plot()`, `barplot()`) or packages like `ggplot2` (`ggplot() + geom_*()`). 5. Customize Plot with titles, labels, colors, themes, and legends for clarity. 6. Display or Save Plot using `print()` or `ggsave()`. 7. Analyze Output to interpret trends, patterns, or anomalies..

Department of Artificial Intelligence & Data Science

Vision of the Department

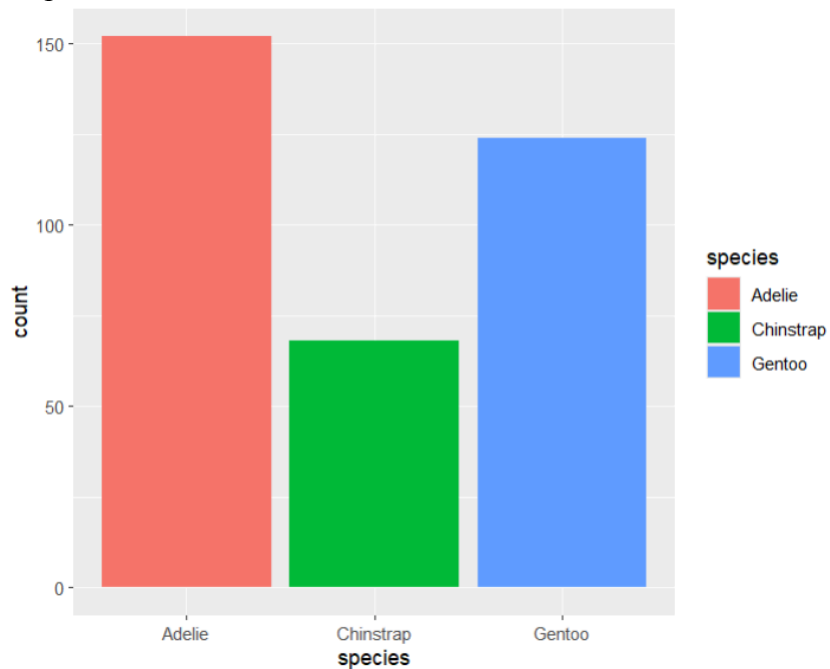
To be a well-known centre for pursuing computer education through innovative pedagogy, value-based education and industry collaboration.

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.

```
Code:
library(tidyverse)
library(palmerpenguins)
# Bar Plot
penguins |> ggplot(aes(x = species)) + geom_bar(aes(fill =
species))
# Scatter Plot
penguins |> ggplot(aes(x = body_mass_g, y =
flipper_length_mm)) + geom_point()
# Box Plot
penguins |> ggplot(aes(x = species, y = flipper_length_mm)) +
geom_boxplot()
# Line Plot
penguins |> ggplot(aes(x = body_mass_g, y =
flipper_length_mm)) + geom_line()
# Stacked Bar Plot
ggplot(penguins, aes(fill=sex, y=flipper_length_mm, x=species))
+ geom_bar(position="dodge", stat="identity")
# Histogram Plot
penguins |> ggplot(aes(x = body_mass_g)) + geom_histogram()
```

Output:





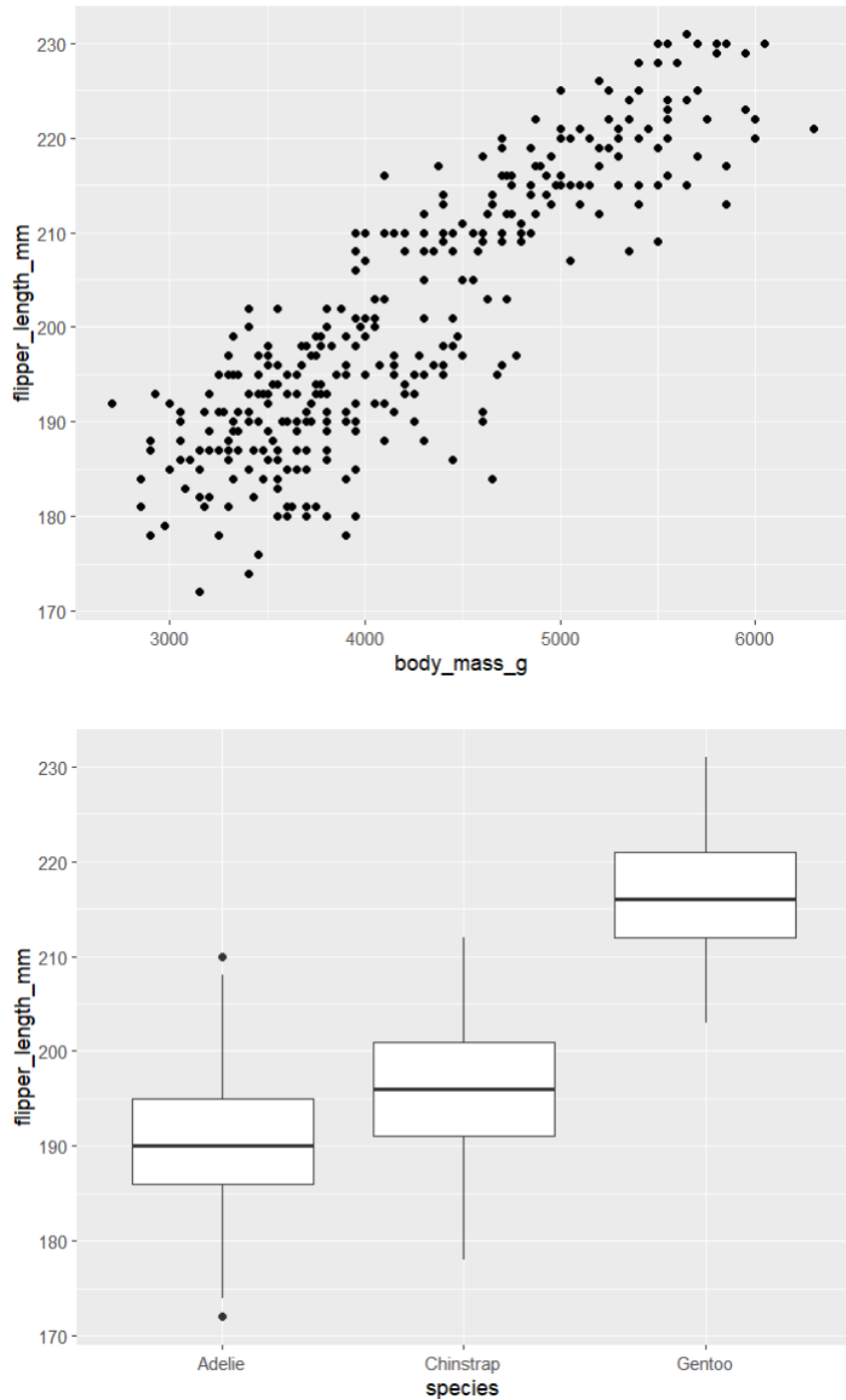
Department of Artificial Intelligence & Data Science

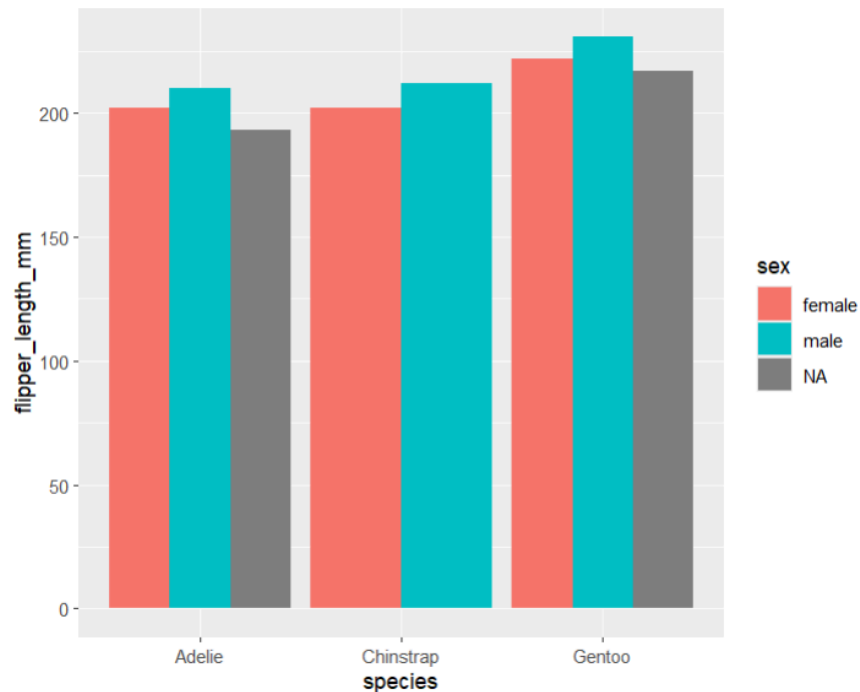
Vision of the Department

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.



**Department of Artificial Intelligence & Data Science****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.***Output Analysis**

Visual outputs display data distributions, relationships, and trends clearly. For example, scatter plots reveal correlations, bar charts compare categories, and boxplots highlight outliers. Using R, plots can be customized with colors, labels, and themes for clarity. The effectiveness of visualization is assessed by readability, interpretability, and the ability to reveal underlying data patterns. Proper visualization enables identifying anomalies, trends over time, or group differences. Interactive plots allow dynamic exploration, providing deeper insights. Analysis confirms R's efficiency in converting complex datasets into meaningful graphical representations.

Link of student Github profile where lab assignment has been uploaded

<https://github.com/sanskruti-1234/BDH.git>

Conclusion

Data visualization in R successfully transforms datasets into interpretable visual formats. Various methods like bar charts, scatter plots, and heatmaps help uncover patterns, trends, and anomalies. R's flexibility, combined with packages like ggplot2 and plotly, allows both static and interactive visualizations, enhancing data analysis and communication. The case study confirms that R is an effective tool for exploratory data analysis, reporting, and deriving actionable insights from large datasets.



Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur - 441 110

NAAC A++

Ph.: 07104-237919, 234623, 329249, 329250 Fax: 07104-232376, Website: www.ycce.edu



Department of Artificial Intelligence & Data Science

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.

Plag Report
(Similarity index <
12%)



Date

30/10/2025