VEL TECH HIGH TECH
DR.RANGARAJAN DR.SAKUNTHALA ENGINEERING COLLEGE
An Autonomous Institution
Approved by AICTE,New Delhi/Affiliated to Anna University,Chennai

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATASCIENCE

21HC52T -DATA ANALYTICS

INNOVATIVEASSIGNMENT–II

Prepared by,

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COURSEDETAILS

COURSE CODE	COURSENAME	YEAR	SEM	CREDITS	STUDENTSSTRENGTH	BATCHES
21HC52T	DATA ANALYTICS	III	V	3	59	21

OBJECTIVES:

- ✓ To understand the techniques of analysis of variance.
- ✓ To gain knowledge in predictive analytics techniques.

UNIT III **T-TEST** **9**

T-test for one sample – sampling distribution of t – t-test procedure – degrees of freedom – estimating the standard error – case studies t-test for two independent samples – statistical hypotheses – sampling distribution – test procedure – p-value – statistical significance – estimating effect size – meta analysis t-test for two related samples

UNIT IV **ANALYSIS OF VARIANCE** **9**

F-test – ANOVA – estimating effect size – multiple comparisons – case studies Analysis of variance with repeated measures Two-factor experiments – three f-tests – two-factor ANOVA – other types of ANOVA Introduction to chi-square tests.

CourseOutcomes:

On completion of the course, the students will be able to:

- ✓ Demonstrate the skills to perform various tests in the given data.
- ✓ Ability to derive inference using Predictive Analytics.

Course	:	**B.TECH**
Course Code	:	**21HC52T**
Title	:	**DATA ANALYTICS**
Student Name	:	
VH No./ Reg. No.	:	
Branch Name	:	AI&DS
Batch No.	:	
Assignment No.	:	II
Submission Date	:	

Faculty Signature

BATCHWISE QUESTIONS

ASSIGNMENT QUESTIONS: **TOTAL STRENGTH: 59**

BATCHES: 21

REGISTER NO	STUDENT NAME	PROBLEM STATEMENT	CO	K LEVEL
BATCH 1				
113021243015	Giri S	Two groups of students, Group A and Group B, took two different preparation courses for a math exam. Group A consists of 20 students with an average score of 85, and Group B consists of 25 students with an average score of 88. Conduct a two-independent-samples t-test in Python to determine if there is a statistically significant difference between the two groups' scores. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter)** 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
113021243014	DhineshAaditya R C	A company claims that their new product improves productivity, and they conducted a study with two groups: one is using the new product and another using the old product. You have data on the performance of both groups. Perform a two-independent-samples t-test in Python to test if the new product indeed leads to improved productivity. Calculate and interpret the effect size. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (**IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3

113021243057	Syed Nayeem Hussain S	You have collected exam scores from a class of 30 students. The class average is expected to be 75. Conduct a one-sample t-test in Python to determine if the class performed significantly different from the expected average. Calculate the t-statistic, degrees of freedom, and p-value. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
BATCH 2				
113021243021	Hemanth Kumar R	Imagine you are analyzing the weights of a sample of 25 apples from a farm. The population mean weight is known to be 150 grams. Conduct a one-sample t-test in Python to check if the sample mean weight is significantly different from the population mean. Calculate the standard error and interpret the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
113021243046	Sanjay Kumar S	A fitness trainer wants to assess the effectiveness of a new workout program. She collects data on the weights of 15 participants before and after completing the program. Use a paired (two-related-samples) t-test in Python to determine if there is a significant change in participants' weights after the program. Calculate and interpret the effect size. **SKELETON:** 1. Introduction 2. Calculation	**CO2**	K3

		3. Code (Code will be relate with calculation) 4. Execution (**IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021234044	Sandeep S	You are analyzing the test scores of 12 students before and after they received tutoring. Perform a paired t-test in Python to assess if tutoring had a statistically significant impact on the students' scores. Calculate the t-statistic, degrees of freedom, and p-value. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (**IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
BATCH 3				
113021243040	Padmasri B	You are conducting a meta-analysis of studies that have investigated the effect of a particular drug on blood pressure. Each study reports the mean change in blood pressure along with standard deviations. Write a Python program to calculate the overall effect size across these studies and determine if the drug has a significant impact on blood pressure. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter)** 5. Statistical diagram (Output**)** 6. Conclusion 7. Reference	**CO3**	K3
114021243050	Shobana Shri J	You have collected data from five different experiments, each testing a different aspect of a	**CO2**	K3

		scientific phenomenon. Perform a meta-analysis using a t-test in Python to combine the results from these experiments and draw conclusions about the overall effect size and its statistical significance. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (**IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
113021243029	Krithika B	Write a Python program that performs a one-sample t-test on a given dataset. Include steps for calculating the t-statistic, degrees of freedom, and p-value. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO2**	K3
BATCH 4				
113021243051	Shyamkumar R	Explain the concept of a one-sample t-test and its significance in hypothesis testing. Provide a Python code example to illustrate how it can be applied to real-world data. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE**	**CO2**	K3

		portable python) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243055	Suberson P	Develop a Python program that conducts a two-independent-samples t-test. Use two sample datasets and explain how to interpret the results, including the p-value and effect size. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter)** 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO2**	K3
113021243052	Siva Moorthi M	Discuss the differences between a one-sample t-test and a two-independent-samples t-test. Write Python code to compare these two types of tests using simulated data. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO2**	K3
BATCH 5				
113021243004	U.Akshaya	Create a Python script to perform a paired (two-related-samples) t-test. Explain the scenario in which this type of t-test is applicable and why it is used instead of the independent-samples t-test. **SKELETON:** 1. Introduction	**CO2**	K3

		2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243005	Alice Suzanne D	Describe the concept of effect size in the context of a paired t-test. Write Python code to calculate and interpret the effect size for a given dataset. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
113021243009	Bhavani lakshmi R	Develop a Python program that facilitates a meta-analysis of t-test results from multiple studies. Explain the purpose and importance of meta-analysis in research. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
BATCH 6				
113021243049	Sharon Kathy rose. K	What are the key challenges in conducting a meta-analysis of t-test results? Provide Python code examples to handle data aggregation and	**CO2**	K3

		analysis from different sources. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
113021243054	Subashini. B	You are conducting a t-test with a sample size of 20. Explain what degrees of freedom mean in the context of this test. How many degrees of freedom are associated with this sample size, and why? provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
BATCH 7				
113021243006	Aparanjitha.G	You have collected data on the heights of 25 individuals. Calculate the standard error of the mean height for this sample. Explain why estimating the standard error is crucial when conducting hypothesis tests. provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**)	CO2	K3

		5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243008	Bandaru sakthilaya	In a study, two groups of students were given different math textbooks for a semester. Group A had 30 students with an average score of 85, and Group B had 35 students with an average score of 88. Conduct a two-independent-samples t-test in Python to test if there is a statistically significant difference in their math scores. provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	CO3	K3
BATCH 8				
113021243001	Afreen Fathima A.S.H	You are studying the effect of a new drug on blood pressure. Formulate null and alternative hypotheses for a one-sample t-test to determine if the drug has a significant impact on blood pressure. Explain the significance of each hypothesis. provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
113021243027	Kirthana R	Describe the concept of a sampling distribution in the context of t-tests. Explain how it is related to the t-test procedure. Provide an example scenario where understanding the sampling	**CO2**	K3

		distribution is crucial. provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243037	Nishandhine.U	You performed a t-test on a sample of 50 individuals and obtained a p-value of 0.03. Interpret this p-value in the context of your hypothesis test. What does it indicate about the statistical significance of your findings? provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter)** 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO2**	K3
BATCH 9				
113021243038	Nithish kumar B	You conducted a paired t-test to compare the performance of students before and after a training program. Calculate the effect size for this test and explain its significance in interpreting the practical importance of your results. provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter)**	**CO2**	K3

		5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
113021243028	Kirubakaran M	You have results from two experiments, Experiment A and Experiment B, both measuring the same outcome. The p-value for Experiment A is 0.01, and the p-value for Experiment B is 0.05. Which experiment has a larger effect size, and how can you determine this from the provided p-values? provide python code and calculation. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO2**	K3
113021243034	Mohammed Thowfiq	The consumers' group concludes that, in spite of the claims of the supermarket, the mean weight of its "one-pound" packages of ground meat drops below the specified 16 ounces even when chance sampling variability is taken into account. (a) Construct a 95 percent confidence interval for the true weight of all "one-pound" packages of ground meat. (b) Interpret this confidence interval **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO2**	K3

BATCH 10				
113021243016	Hamsageetha KV	You are a quality control manager at a factory that produces three different brands of widgets: Brand A, Brand B, and Brand C. You want to determine if there are any significant differences in the weight of widgets produced by these three brands. You collect random samples of widgets from each brand, with 20 widgets from each brand. Perform a one-way ANOVA using Python to test if there are any statistically significant differences in widget weights among the three brands. Provide the Python code, F-statistic, and the interpretation of the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243059	Umamaheshwari.M	In a plant nursery, you are studying the growth of plants under different lighting conditions (Natural Light, Artificial Light, and No Light) and different watering regimes (Frequent Watering and Infrequent Watering). You have 3 plants under each combination of lighting and watering conditions, resulting in a total of 18 plants. Perform a two-factor ANOVA using Python to determine if there are significant main effects of lighting, watering, or an interaction effect on plant growth. Provide the Python code, F-statistics, and any relevant post hoc tests. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3

113021243053	Soundarya M	You are conducting an experiment to evaluate the impact of three different exercise routines (Routine A, Routine B, and Routine C) on participants' fitness levels. You measure participants' fitness levels before they start the routines and again after 4 weeks of training. Each participant goes through all three routines in a counterbalanced order. Perform a repeated measures ANOVA using Python to determine if there are significant differences in fitness levels across the three exercise routines over time. Provide the Python code, F-statistic, and interpret the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
BATCH 11				
113021243024	Karthik T	You have conducted a one-way ANOVA to compare the performance of four different teaching methods on student test scores. After obtaining the F-statistic and p-value, calculate the effect size (eta-squared) for this ANOVA. Explain the meaning of the effect size in the context of this study and how it complements the F-test results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243022	Jayasurya S.R	In a psychology study, you have conducted a one-way ANOVA to compare the effectiveness of four different therapies in reducing anxiety levels. The ANOVA indicates a significant	**CO3**	K3

		difference among the therapies. Perform a post hoc Tukey's test using Python to determine which therapies are significantly different from each other. Provide the Python code and a summary of the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
113021243012	Darsan S	You conducted a study to compare the effectiveness of two different marketing strategies (Strategy A and Strategy B) in increasing website traffic. After conducting a t-test, calculate and interpret the effect size (Cohen's d) for the difference in website traffic between the two strategies. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
BATCH 12				
113021243060	Varshini A S	You have a dataset containing monthly sales figures for a store over the past year. Create a line plot in Python to visualize the trend in monthly sales over time. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**)	**CO3**	K3

		5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
113021243020	Hemalatha B	You are simulating the rolling of a fair six-sided die. Write Python code to simulate rolling the die 1000 times and calculate the probability distribution of each outcome (1 through 6). Display the results in a histogram. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243017	Harini M	Calculate a 95% confidence interval for the mean height of a sample of 100 individuals. Use Python to compute the lower and upper bounds of the interval and explain what it represents. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
BATCH 13				
113021243010	Bhuvaneshwari.S	You are studying the relationship between the number of hours spent studying and students' exam scores. Perform a linear regression analysis in Python to create a regression model and interpret the coefficients (slope and intercept). **SKELETON:** 1. Introduction	**CO3**	K3

		2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
114021243056	Sudarshni.S	In a survey, 200 participants were asked about their preferred mode of transportation (Car, Bus, Bike) to work. Conduct a chi-square goodness-of-fit test in Python to assess if the observed transportation preferences match the expected distribution of 40% Car, 30% Bus, and 30% Bike. Provide the Python code and interpret the test results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243039	Nivetha.M	You have data on the performance of students from three different schools (School X, School Y, and School Z) in a math competition. Conduct a one-way ANOVA in Python to determine if there are any significant differences in the mean scores among the three schools. Include the Python code and interpret the F-statistic. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter)** 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3

BATCH 14				
113021243033	Manoj raj G	You are analyzing the test scores of two groups of students: Group A and Group B. Perform an independent samples t-test in Python to determine if there is a statistically significant difference in the mean scores between the two groups. Provide the Python code and interpret the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243031	Maneeshkumar G	A company wants to assess if the preferences for three different product features (Feature A, Feature B, Feature C) are consistent across three different customer segments (Segment X, Segment Y, Segment Z). They collect data from 150 customers in each segment regarding their preferences. Perform a chi-square test for homogeneity using Python to analyze the data and determine if the preferences for product features are consistent across the customer segments. Provide the Python code and an interpretation of the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243002	Ajay Selvam K	You have collected data on the relationship between the choice of smartphone brand (Apple, Samsung, Google) and the age group of users (18-30, 31-45, 46-60) from a sample of 300	**CO3**	K3

		individuals. Conduct a chi-square test of independence using Python to determine if there is a significant association between smartphone brand choice and age group. Include the Python code, chi-square statistic, degrees of freedom, and a conclusion regarding the relationship. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. (For visualization use **WEKA tool)** 7. Conclusion 8. Reference		
BATCH 15				
113021243048	Sharan T G	A political pollster is interested in determining whether voter preferences for three major political parties (Party A, Party B, and Party C) follow a certain expected distribution in a specific region. The expected distribution is 40% for Party A, 30% for Party B, and 30% for Party C. Collect survey data from 200 voters in that region and perform a chi-square goodness-of-fit test in Python to assess whether the observed voter preferences match the expected distribution. Provide the Python code and interpret the test results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
113021243013	Dhanesh raj R	In a psychological experiment, you have two groups of participants: Group A and Group B. Both groups receive different treatments (Treatment X and Treatment Y) over multiple sessions. You want to examine the impact of the	**CO3**	K3

		treatment and group on a specific outcome measure. Conduct a mixed-design ANOVA using Python to analyze the data and report any significant main effects or interactions. Include the Python code and an interpretation of the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243058	Tamil Nilavan S	You are conducting a study to analyze the impact of both time (Morning, Afternoon, Evening) and exercise intensity (Low, Moderate, High) on participants' heart rates. You collect data from 45 participants and want to determine if there are any significant main effects or interaction effects. Perform a two-way ANOVA using Python to analyze the data and explain the interpretation of the results. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference	**CO3**	K3
BATCH 16				
113021243041	prakash.d	In a manufacturing process, you are analyzing the impact of two factors: Machine Type (A, B) and Operator (Operator 1, Operator 2) on product defects. Perform a two-level nested ANOVA to examine how the choice of machine and operator affect product quality. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with	**CO3**	K3

		calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243011	chandru.p	You have collected data on the response times of participants in three different experimental conditions. Perform a Kruskal-Wallis test to determine if there are significant differences in response times among the conditions when the data violate the assumptions of parametric tests. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO3**	K3
113021243030	lokeshwar.g.k	You are investigating the effect of three different types of fertilizer (A, B, C) on the growth of plants. You have measured the height of 30 plants, with 10 in each fertilizer group. Conduct a one-way ANOVA to determine if there are statistically significant differences in plant height due to the different fertilizers. Include effect size calculations and a post hoc test if necessary. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO3**	K3

BATCH 17				
113021243035	C.Muthukameshwaran	In a study, you are examining the impact of both diet type (Low-Fat, High-Fat) and exercise frequency (Low, Moderate, High) on participants' cholesterol levels. Perform a two-way ANOVA to analyze the data and investigate potential main effects and interactions between diet and exercise. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO3**	K3
113021243026	S.Kavi Bharathi	You are conducting a psychological experiment where participants are subjected to three different levels of stress (Low, Moderate, High) at three different time points (Before, During, After). Analyze the data using a repeated measures ANOVA to assess the effects of stress levels and time points on participants' anxiety levels. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO3**	K3
113021243003	G.Ajith	After conducting a one-way ANOVA to compare the performance of four different teaching methods on student test scores, calculate the effect size (partial eta-squared) and interpret its magnitude in terms of practical	**CO3**	K3

		significance. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
BATCH 18				
113021243043	Sam Jeffy B	In a research study, you have conducted a two-way ANOVA with three levels for each factor, resulting in a significant interaction effect. Perform multiple comparisons using Tukey's post hoc test to determine which specific combinations of levels are significantly different from each other. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO3**	K3
113021243018	harinish A	You are analyzing the distribution of eye colors (Brown, Blue, Green) among 300 individuals. Conduct a chi-square goodness-of-fit test to determine if the observed distribution matches the expected distribution of 40% Brown, 30% Blue, and 30% Green. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with	**CO3**	K3

		calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. Conclusion 7. Reference		
113021243007	Balaji I	In a survey, you collect data on the relationship between gender (Male, Female) and voting preference (Candidate A, Candidate B, Undecided) among 500 participants. Perform a chi-square test of independence to determine if there is a significant association between gender and voting preference. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. (For visualization use **WEKA tool)** 7. Conclusion 8. Reference	**CO3**	K3
		BATCH 19		
113021243036	S. NawinSrivatsav	You are conducting a study on the effect of both treatment type (A, B, C) and participants' initial health status (Low, Moderate, High) on recovery time. Perform a two-way analysis of covariance (ANCOVA) to investigate the effects of treatment, initial health status, and the covariate (e.g., age) on recovery time. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)**	**CO2**	K3

		6. Conclusion 7. Reference		
113021243047	K. Sanjeev Babu	Find the critical t values for the following hypothesis tests: (a) two-tailed test, $\alpha = .05$, df = 12 (b) one-tailed test, lower tail critical, $\alpha = .01$, df = 19 (c) one-tailed test, upper tail critical, $\alpha = .05$, df = 38 (d) two-tailed test, $\alpha = .01$, df = 48 **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference	**CO2**	K3
113021243032	P. Manish Kumar	A consumers' group randomly samples 10 "one-pound" packages of ground beef sold by a supermarket. Calculate (a) the mean and (b) the estimated standard error of the mean for this sample, given the following weights in ounces: 16, 15, 14, 15, 14, 15, 16, 14, 14, 14. (NOTE: Refer to Panels I and II of Table 13.1 for detailed guidance when calculating the mean and estimated standard error for this new set of data.) **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **IDLE portable python**) 5. Statistical diagram (Output) 6. (For visualization use **WEKA tool)** 7. Conclusion 8. Reference	**CO2**	K3
BATCH 20				
113021243045	Sanjay S	You are conducting an experiment to compare	**CO2**	K3

		the performance of three different teaching methods (A, B, and C) on students' test scores. You have collected data from 60 students, with 20 students randomly assigned to each teaching method. You want to determine if there are any statistically significant differences in the mean test scores among the three teaching methods. Additionally, you want to estimate the effect size and perform multiple comparisons if necessary. Write a Python program to address the following tasks: Perform a one-way ANOVA to test if there are any significant differences in mean test scores among the three teaching methods. Calculate and interpret the F-statistic and associated p-value. If the ANOVA indicates significant differences, conduct a post hoc Tukey's test to identify which teaching methods are significantly different from each other. Calculate the effect size (eta-squared) for the ANOVA, and explain its practical significance. Plot a graph to visualize the mean test scores for each teaching method along with error bars to represent variability. Provide a summary of your findings, including which teaching methods, if any, are significantly different and the practical implications of these differences. Your program should be well-commented and include necessary libraries and functions for conducting ANOVA, post hoc tests, effect size calculation, and data visualization.		
113021243019	Hariprasanth P	A library system lends books for periods of 21 days. This policy is being reevaluated in view of a possible new loan period that could be either longer or shorter than 21 days. To aid in making this decision, book-lending records were consulted to determine the loan periods actually used by the patrons. A random sample of eight records revealed the following loan periods in days: 21, 15, 12, 24, 20, 21, 13, and 16. Test the null hypothesis with t, using the .05 level of significance. **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE**	**CO2**	K3

		portable python) 5. Statistical diagram (Output)(For visualization use **WEKA tool)** 6. Conclusion 7. Reference		
		BATCH 21		
113021243023	Joby J	A political scientist determines whether males and females differ, on average, about the amount of money that, in their opinion, should be spent by the U.S. government on homeland security. After being informed about the size of the current budget for homeland security, in billions of dollars, randomly selected males and females are asked to indicate the percent by which they would alter this amount—for example, –8 percent **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output) 6. `(For visualization use **WEKA tool)** 7. Conclusion 8. Reference	**CO2**	K3
113021243025	Karthikeyan J	Using Table B in Appendix C, find the critical t values for each of the following hypothesis tests: (a) two-tailed test; $\alpha = .05$; n1 = 12; n2 = 11 (b) one-tailed test, upper tail critical; $\alpha = .05$; n1 = 15; n2 = 13 (c) one-tailed test, lower tail critical; $\alpha = .01$; n1 = n2 = 25 (d) two-tailed test; $\alpha = .01$; n1 = 8; n2 = 10 **SKELETON:** 1. Introduction 2. Calculation 3. Code (Code will be relate with calculation) 4. Execution (can use **jupyter, IDLE portable python**) 5. Statistical diagram (Output)	**CO2**	K3

		6. (For visualization use **WEKA tool)** 7. Conclusion 8. Reference		