ANOVA ANALYSIS

Problem Statements

Q1. *A teacher wants to investigate the impact of three different teaching methods (lecture, group discussion, and hands-on activities) on students' exam scores. They administer the same exam to three groups of students taught with each method and analyze the scores to determine* ***if there is a significant difference in performance among the teaching methods.***

|  |  |
| --- | --- |
| Teaching Method | A B C |
| Lecture | 56 67 76 |
| Group Discussion | 68 79 85 |
| Hands-on Activities | 88 82 87 |

One independent categorical variable : Teaching methods. The table provided is an example of one-way classification.

Soln:

Ho : There is no significant difference between the teaching methods

H1 : There is a significant difference between the teaching methods

Q2. *A teacher wants to investigate the impact of three different teaching methods (lecture, group discussion, and hands-on activities) with genders on students' exam scores. They administer the same exam to different genders of students taught with each method and analyze the scores to determine* ***if there is a significant difference in performance among the teaching methods and among the genders.***

|  |  |  |
| --- | --- | --- |
| Teaching Method | Gender | |
|  | F | M |
| Lecture | 56 | 67 |
| Group Discussion | 68 | 79 |
| Hands-on Activities | 88 | 82 |

Two independent categorical variable : Teaching method and Gender. The table provided is an example of two-way classification.

Soln:

Ho : There is no significant difference between the teaching methods and gender.

H1 : There is a significant difference between the teaching methods and gender.

Q3. *To conduct an ANOVA analysis for the time taken to recover from a blood infection using two types of treatment (injection and oral medicine).* ***Determine the effectiveness of the treatments.***

|  |  |  |  |
| --- | --- | --- | --- |
| Treatment | *Recovery Time (days)* | | |
| Injection | 3 | 4 | 5 |
| Oral Medicine | 5 | 7 | 6 |

One independent categorical variable : Treatment and the table provided is an example of one-way classification.

Soln:

Ho : There is no significant difference between the treatments

H1 : There is a significant difference between the treatmentss

Q4. *To conduct an ANOVA analysis for the time taken to recover from a blood infection .Children are randomly assigned to different treatment methods(injection and oral medicine) and treated by either pediatricians or general practitioners. Determine if there are significant differences in recovery time based on treatment type, doctors' domain, or their interaction.*

|  |  |  |
| --- | --- | --- |
| Treatment | *Doctor’s Domain* | *Recover days* |
| Injection | Pediatrician | *3* |
| Oral Medicine | General Practitioner | 5 |
| Injection | General Practitioner | 4 |
| Oral Medicine | Pediatrician | 4 |

The table provided is an example of two-way classification. It has two independent variables called treatment methods and doctor’s domain.

Soln:

Ho : There is no significant difference between the treatments and the domain of doctors

H1 : There is a significant difference between the treatments and the domain of doctors