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**Course:** **DA (Data Analytics)**

**Experiment No.:** 3

**Name of the Experiment:** Hypothesis testing

**Objective:** Perform Hypothesis testing using f-test with SAS

**Problem Statement:**

This analysis is aimed at those who are interested in statistics related to earthquakes that have occurred on the Earth. The dataset contains various attributes associated with earthquakes such as latitude, longitude, depth, magnitude, nearest station, RMS time and type. The main aim is to determine if the mean of magnitudes of all types of earthquakes is same or different.

**Implementation:**

Dataset used: SASHELP.QUAKES

Null hypothesis: The mean of magnitudes of all types of earthquakes is same

Alternate hypothesis: The mean of magnitudes of all types of earthquakes is different

**Code:**

CREATE TABLE WORK.query AS

SELECT Latitude , Longitude , **'Depth'n** , Magnitude , dNearestStation , RootMeanSquareTime , **'Type'n** FROM SASHELP.QUAKES;

**RUN**;

**QUIT**;

**PROC** **DATASETS** NOLIST NODETAILS;

CONTENTS DATA=WORK.query OUT=WORK.details;

**RUN**;

**PROC** **ANOVA** DATA = WORK.query;

CLASS type;

MODEL Magnitude = type;

MEANS type / tukey lines;

**RUN**;

**PROC** **PRINT** DATA=WORK.details;

**RUN**;

**Output:**

Table

Description automatically generated with medium confidence

Table

Description automatically generated

Chart, box and whisker chart

Description automatically generated

Table

Description automatically generated with medium confidence

Chart

Description automatically generated

**Conclusion:**

* Since the p-value obtained in the table above is < 0.001, i.e., the p-value is < 0.01, the null hypothesis can be rejected. Therefore, the mean of magnitudes of all types of earthquakes is different.