

**National University of the Altiplano**  
**Faculty of Statistical and Computer Engineering**

**Shiny Application: t-test and ANOVA**

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[Aplicación Shiny Publicada](#)

[GitHub Repository](#)

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## 1 Introduction

The application developed in R/Shiny enables complete statistical analysis for mean comparison through parametric tests. Its interactive design facilitates:

- **Descriptive analysis:** Calculation of measures such as mean, median, standard deviation and coefficient of variation
- **Inferential tests:** Implementation of:
  - t-tests for independent and paired samples
  - One-way ANOVA for multiple group comparison
- **Data validation:** Automatic detection of outliers and missing values

## 2 Objectives

### 2.1 General Objective

To develop an interactive platform that integrates basic statistical analysis with didactic tools to facilitate result interpretation.

### 2.2 Specific Objectives

- Implement a tab-based interface for better navigation
- Generate automatic interpretations of statistical results
- Provide graphical visualizations with integrated explanations
- Enable result export in standard formats (Excel and PDF)

## 3 Methodology

### 3.1 Application Structure

The tool follows a modular architecture:

- **Control panel:**
  - File upload (CSV/Excel)
  - Variable selection
  - Analysis configuration
- **Visualization:**
  - Result tables
  - Interactive graphs
  - Textual interpretation

### 3.2 Implemented Technologies

Main packages used include:

- **Shiny:** For interactive web interface
- **ggplot2:** High-quality graph generation
- **dplyr:** Efficient data manipulation
- **DT:** Interactive table visualization

## 4 Results and Features

The application offers:

- **Complete analysis:**
  - Detailed descriptive statistics
  - Hypothesis testing with p-value
  - Assumption validation
- **Intuitive visualization:**
  - Group boxplots
  - Distribution histograms
  - Scatter plots
- **Flexible export:**

- PDF reports with results
- Excel tables for further analysis

## 5 Conclusions

The developed application represents a complete solution that:

- Combines analytical capabilities with a didactic approach
- Facilitates learning of statistical concepts
- Provides professional-ready results
- Adapts to various academic and research contexts