t-test Template

Rapport package team @ https://github.com/aL3xa/rapport

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## Description

A t-test report with table of descriptives, diagnostic tests and t-test specific statistics.

## Introduction

In a nutshell, *t-test* is a statistical test that assesses hypothesis of equality of two means. But in theory, any hypothesis test that yields statistic which follows [*t-distribution*](https://en.wikipedia.org/wiki/Student%27s_t-distribution) can be considered a *t-test*. The most common usage of *t-test* is to:

* compare the mean of a variable with given test mean value - **one-sample *t-test***
* compare means of two variables from independent samples - **independent samples *t-test***
* compare means of two variables from dependent samples - **paired-samples *t-test***

## Overview

Independent samples *t-test* is carried out with *Internet usage in leisure time (hours per day)* as dependent variable, and *Gender* as independent variable. Confidence interval is set to 95%. Equality of variances wasn't assumed.

## Descriptives

In order to get more insight on the underlying data, a table of basic descriptive statistics is displayed below.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Gender** | **min** | **max** | **mean** | **sd** | **var** | **median** | **IQR** | **skewness** | **kurtosis** |
| male | 0 | 12 | 3.2699 | 1.9535 | 3.8161 | 3 | 3 | 0.9443 | 0.9858 |
| female | 0 | 12 | 3.0643 | 2.3546 | 5.5442 | 2 | 3 | 1.3979 | 1.8696 |

## Diagnostics

Since *t-test* is a parametric technique, it sets some basic assumptions on distribution shape: it has to be *normal* (or approximately normal). A few normality test are to be applied, in order to screen possible departures from normality.

### Normality Tests

We will use *Shapiro-Wilk*, *Lilliefors* and *Anderson-Darling* tests to screen departures from normality in the response variable (*Internet usage in leisure time (hours per day)*).

|  |  |  |
| --- | --- | --- |
|  | **N** | **p** |
| Shapiro-Wilk normality test | 0.9001 | 0 |
| Lilliefors (Kolmogorov-Smirnov) normality test | 0.168 | 0 |
| Anderson-Darling normality test | 18.753 | 0 |

As you can see, applied tests confirm departures from normality.

## Results

Welch Two Sample t-test was applied, and significant differences were found.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **statistic** | **df** | **p** | **CI(lower)** | **CI(upper)** |
| t | 1.1483 | 457.8625 | 0.2514 | -0.1463 | 0.5576 |

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|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** | **NA** |
| Internet usage in leisure time (hours per day) | 0 | 12 | 3.1994 | 2.1436 | 4.5951 | 3 | 2 | 1.1847 | 1.5334 |

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As you can see, applied tests confirm departures from normality.

## Results

One Sample t-test was applied, and significant differences were found.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **statistic** | **df** | **p** | **CI(lower)** | **CI(upper)** |
| t | -0.0072 | 671 | 0.9943 | 3.037 | 3.3618 |

This report was generated with [R](http://www.r-project.org/) (2.14.0) and [rapport](http://al3xa.github.com/rapport/) (0.2) in 0.705 sec on x86\_64-unknown-linux-gnu platform.

