

Case Study 1

Evaluation of the average download speed of a broadband service provider

The Experiment¹

According to Brazilian regulation agency ANATEL, the average download speed can be considered in conformity with the contracted value as long as it is superior to 60% of the nominal value. In this case study, we wish to investigate whether a given provider is fulfilling this condition in a 10MBps residential connection.

Twenty measurements of download speed were collected using [SpeedTest](#) under homogeneous usage conditions (same computer, same browser, automatic update services disabled, no other software being used besides the browser). The collected data is available in our [GitHub repo](#).

Activities

Your task is to analyze this experimental data in order to answer the following question:

Is the actual average download speed in accordance with the regulations?

Your analysis should include:

- Definition of the test hypotheses;
- Test of the hypotheses;
- Estimation of the effect size and confidence interval on the relevant value;
- Verification of the assumptions of the test;
- Drawing of conclusions and recommendations.

Remember that your conclusions should always be placed in the context of the original technical/scientific question.

Report

You must deliver a short report detailing your analysis and the results obtained. Instructions for writing your report depend on the course you're taking, and are given below:

1) For graduate (PPGEE) Students

Your report will be evaluated according to:

- Compliance with the required format (see below);
- Reproducibility of results;
- Technical correctness;
- Structure of argumentation;
- Correct use of language (grammar, orthography, etc.);

¹Adapted from R.F.O. Costa's course project for the Design and Analysis of Experiments Course, PPGEE-UFMG, June 2012. The data used in this case study is not the original one.

The report **must** be produced using [R Markdown](#), and should contain the reproducible analysis code embedded as code blocks within the document. Please send me only the **.Rmd** file (the analysis should assume that the data file is in the same directory as the report file). A template for the case study reports is available in our [GitHub repo](#).

Reports written in either Portuguese, English, or Spanish will be accepted.

For undergrad (Systems Engineering) Students

Your report will be evaluated according to:

- Technical correctness;
- Correct use of language (grammar, orthography, etc.);

The report has no particular template. [R Markdown](#) is suggested, but not mandatory. Please send me the **.pdf** file (**NO** .doc, .odt, or other exotic formats please) and the **.R** analysis file.