

Final assignment for the course Data visualization with R

Master Life Science Informatics

Title: Impact of covid-19 in mobility

Methods:

- Methods from descriptive statistics: Descriptive Statistics
- Statistics for scientific work: Literate Statistical Analysis
- Advanced Data visualization techniques: ggplot2

Introduction:

As a data analyst consultant for a firm working on the wearables sector that wants to enter the IoT market. As an expert on Life Science Informatics you are required to analyse the mobility trends during the Covid-19 pandemic from IoT devices and show how valuable is this data.

The client company is working on a new line of products on the sports market and it is interested in knowing the Covid-19 impact on mobility. The client hopes to develop new services or adapt existing ones. The question is therefore to know which potential markets are the most interesting. However, they are not sure that having access to this data is necessary, and therefore hiring your services. Therefore, it is important that you transmit why they should pay attention/invest in their collection and analysis.

Based on this you have to prepare a presentation (power point slides) to convince your client, for which you have 5 minutes and one R notebook with scientifically oriented analysis (2000-3000 words, including literature).

Data to be analysed: Apple's mobility trend reports show how human mobility has changed in countries and cities worldwide since January 2020 and are based on location data of Apple's "maps" services. It is designed to help mitigate the spread of COVID-19, provide governments, research institutions, health authorities, and the general public with insights on the effects on human mobility of national and regional lockdown policies. The data covers 63 countries, 530 provinces and all major cities worldwide. (Source: <https://www.apple.com/covid19/mobility>)

Criteria:

- Good research question and result
- Good contextualisation of the statistical analysis in the selected region
- Quality and diversity of the graphics used
- Quality of the presentation: engaging capacity and clarity of the message.
- Using statistical key figures correctly
- Use and explanation of (advanced) statistical and visualization techniques not covered in the course.

Formal requirements for the final assignment project

Title page

Logo, subject, subject, mat no., e-mail, name

Overview

Short summary, keywords

List of contents, figures, tables, listings, abbreviations ...

1. Introduction

Short description of the topic and transition to the Problem/State of the Art.

2. Problem definition

State-of-the-Art

Introduction to the problem

3. Objectives

Brief formulation of the objectives of this work.

4. Methods

Description of the method and different Steps, what has been done? Why it is done in that way?

5. Results

Presentation and interpretation of the results.

6. Discussion

Pro- and contra discussion on results and the work.

7. Conclusions

Concluding words and a brief outlook on what else could be done or what the results could be used for.

Literature

Citations, online sources, data, images, ...

Appendix

Maps, source code, files...

Tables

Tab. 1: Frei erfundene Daten. Daten aus [1].

Col 1	Col 2	Col 3	Col 4
50,004	34,986	45,367	56,38
45,095	56,378	93,387	7,378
78,092	76,456	8,738	398,000

- Cite external data!
- Each table has a heading!
- Own data is not quoted!
- Foreign and own data are not screened!
- Tables in computer science ALWAYS have this format!
- Tables are referenced and mentioned from the text (min. 4 to 5 sentences per table) (Tab. 1)

Figures

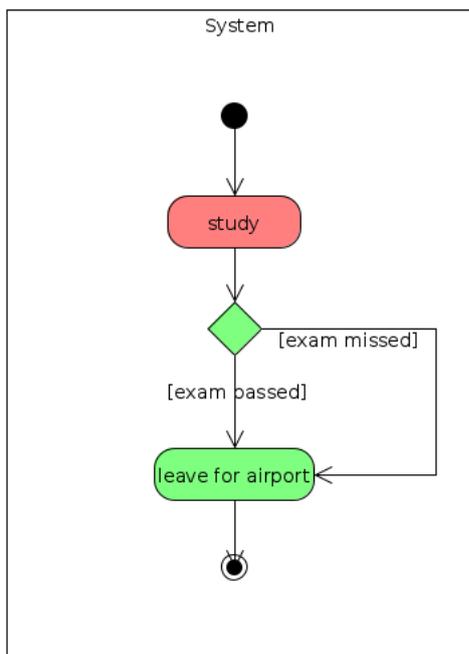


Fig. 1: Any picture. Data from [2].

- Images always have the title under the figure
- If graphics are rebuilt, the original must be quoted
- Own graphics are always (very) positive!
- Graphics should not be blurred (Everything well readable: 320 dpi)
- Graphics are referenced and mentioned from the text (min. 4 to 5 sentences per Figure) e.g. (Fig. 1)

Listings

Lst. 1: Python Hallo-Welt Programm. Quellcode aus [1].

```
0 #!/usr/bin/env python3
1
2 def main():
3     print("Hallo Welt")
4
5 if __name__ == '__main__':
6     main()
```

- Quote foreign code snippets and programs!
- Every listing has a headline!
- Own programs are not quoted! These will be added to the appendix and it will be this one! Also too long programs are not used for listing!
- Foreign and own source codes are NEVER screen-shoted!
- Listings are referenced and mentioned from the text (min. 1 to 3 sentences per Listing) (Lst. 1)!

Citations:

Web links and URLs: All web links and URLs, including links to the authors' own websites, should be given a reference number and included in the reference list rather than within the text of the manuscript. They should be provided in full, including both the title of the site and the URL, as well as the date the site was accessed, in the following format: The Mouse Tumor Biology Database. <http://tumor.informatics.jax.org/mtbwi/index.do>. Accessed 20 May 2013.

Examples reference style:

Article within a journal

Smith J, Jones M Jr, Houghton L (1999) Future of health insurance. N Engl J Med 965:325-329.

Article by DOI (with page numbers)

Slifka MK, Whitton JL (2000) Clinical implications of dysregulated cytokine production. J Mol Med 78:74-80. doi:10.1007/s001090000086.

Article by DOI (before issue publication and with page numbers)

Slifka MK, Whitton JL (2000) Clinical implications of dysregulated cytokine production. J Mol Med. doi:10.1007/s001090000086.

Article in electronic journal by DOI (no paginated version)

Slifka MK, Whitton JL (2000) Clinical implications of dysregulated cytokine production. Dig J Mol Med. doi:10.1007/s801090000086.

More information on citations in: <https://energyinformatics.springeropen.com/submission-guidelines/preparing-your-manuscript/research>