



**FACULTY  
OF MATHEMATICS  
AND PHYSICS**  
Charles University

## **BACHELOR THESIS**

Name Surname

**Thesis title**

Name of the department

Supervisor of the bachelor thesis: Supervisor's Name

Study programme: study programme

Study branch: study branch

Prague YEAR

I declare that I carried out this bachelor thesis independently, and only with the cited sources, literature and other professional sources. It has not been used to obtain another or the same degree.

I understand that my work relates to the rights and obligations under the Act No. 121/2000 Sb., the Copyright Act, as amended, in particular the fact that the Charles University has the right to conclude a license agreement on the use of this work as a school work pursuant to Section 60 subsection 1 of the Copyright Act.

In ..... date .....  
Author's signature

Dedication.

Title: Thesis title

Author: Name Surname

Department: Name of the department

Supervisor: Supervisor's Name, department

Abstract: Abstract.

Keywords: key words

# Contents

<b>Introduction</b>	<b>2</b>
<b>1 Title of the first chapter</b>	<b>3</b>
1.1 Title of the first subchapter of the first chapter . . . . .	3
1.2 Title of the second subchapter of the first chapter . . . . .	3
<b>2 Title of the second chapter</b>	<b>4</b>
2.1 Title of the first subchapter of the second chapter . . . . .	4
2.2 Title of the second subchapter of the second chapter . . . . .	4
<b>Conclusion</b>	<b>5</b>
<b>Bibliography</b>	<b>6</b>
<b>List of Figures</b>	<b>7</b>
<b>List of Tables</b>	<b>8</b>
<b>List of Abbreviations</b>	<b>9</b>
<b>A Attachments</b>	<b>10</b>
A.1 First Attachment . . . . .	10

# Introduction

Database refers to a set of related data accessed through the use of a database management system. [1] CSV files (Comma Separated Value files) are common way of exchanging and converting data between various spreadsheet programs. [2] Through this definition, we can see even a simple collection of CSV files accessed through some programs may be seen as an database itself.

SQL (Structured Query Language) is a language used to manage data, especially in a relational database management system. [3] It was first introduced at 1970s [3] and is one of the most used query languages. Despite being standardized at 1987 by International Organization for Standardization [4], there are virtually no implementations adhere to it fully. [3] Standard SQL is a typed language (Every data value belongs to some data type) [5] and the language design is therefore not much suitable for type-less databases like a collection of CSV files. Despite that, there are some implementations of SQL (eg. `q` [6]), which tries to implement SQL on CSV files.

SQL itself requires large amount of text to be written for running even a simple queries and Unix ecosystem misses a tool<sup>1</sup>, which would allowed running a short enough queries over CSV files with similar semantics like SQL has. And this is the reason, why `lsql-csv` was created.

Haskell is a language with great features for working with text [7] and therefore it was selected for the task of implementation of `lsql-csv`.

---

<sup>1</sup>Or author don't know about it

# 1. Title of the first chapter

An example citation: [8]

## 1.1 Title of the first subchapter of the first chapter

## 1.2 Title of the second subchapter of the first chapter

## 2. Title of the second chapter

2.1 Title of the first subchapter of the second chapter

2.2 Title of the second subchapter of the second chapter



# Conclusion

# Bibliography

- [1] Wikipedia contributors. Database — Wikipedia, the free encyclopedia, 2024. [Online; accessed 16-February-2024].
- [2] Yakov Shafranovich. Common Format and MIME Type for Comma-Separated Values (CSV) Files. RFC 4180, October 2005.
- [3] Wikipedia contributors. Sql — Wikipedia, the free encyclopedia, 2024. [Online; accessed 16-February-2024].
- [4] Iso 9075:1987: Information technology – database languages sql – part 1: Framework (sql/framework). Standard, International Organization for Standardization, Geneva, CH, June 1987.
- [5] Iso 9075-1:2023: Information technology – database languages sql – part 1: Framework (sql/framework). Standard, International Organization for Standardization, Geneva, CH, June 2023.
- [6] q - text as data, 2024. [Online; accessed 18-February-2024].
- [7] Alejandro Serrano Mena. *Practical Haskell - A real world guide to programming*. Second Edition. Apress, New York, 2019.
- [8] J. Anděl. *Základy matematické statistiky*. Druhé opravené vydání. Matfyzpress, Praha, 2007.

# List of Figures

# List of Tables

# List of Abbreviations

# A. Attachments

## A.1 First Attachment