



Assignment Report

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Report

About

The dataset of our interest was contributed by the business operations survey (2018) and revolves around the changing nature of work in New Zealand and its impacts on business. Some of the influencing factors could be the measure of work flexibility, workplace bullying, automation, and addressing of pay gaps. The dataset consists of 6 columns/attributes and 12831 rows/samples.

Objective

The objective here was to build what would work like a highly flexible search engine for the dataset. It is meant to allow users to look up one or a number of data observations (row/s), present in the dataset, using any of the search criteria (In this case: description, industry, level, size, line_code and value) as per their preference.

We approached this problem with three different programming languages:

- C++
- Python
- Shell Script

Analysis

Number of lines of code needed to complete the program:

- For C++, 293 lines of code
- For Python, 79 lines of code
- For Shell Script, 60 lines of code

Given below is our evaluation of the languages using various criteria, based on our work experience:

	Readability	Writability	Reliability	Efficiency	Effectiveness
C++	Not very readable as code becomes lengthy. Many difficult keywords	Easier to write than to read. Although little bit complex than the other ones. It's high level of data abstraction and expressivity compliments its writability	Exception handling, aliasing, readability and writability ensures its reliability	It is the slowest among the three in terms of execution time.	Produces good results but requires the highest time.
Python	Highly readable due to the amount of whitespaces. Uses English keywords. Much more clearly defined	It was the easiest to write among the three due to the friendly and straightforward syntax. Clear flow from top to bottom as well as its automatic memory management compliment it's writability a lot	Supports exception handling. Can be run in an interpreter and has a standardized library which enriches its reliability	It is faster than C++ in terms of execution time.	Produces good results faster than C++.
Shell Script	It is quite readable as code is short and not complicated	It has a lot of built-in function and almost friendly syntax, regular expression make the shell script one of the most potent competitors in writability scale.	Use of standardized commands , regular expression ensures its reliability	It is the fastest among the three in terms of execution	Produces excellent results taking the least time.

Conclusion

By observing the implementation of these three languages, it can be said that, for handling a CSV file, Shell script will be the best option, then Python and lastly C++. As Shell script was the most efficient and faster one, python was quite decent, but comparatively, C++ had shown a bad result. On the other hand, in terms of readability, writability according to our observation, python will be ahead of the other two. But In terms of efficiency, reliability and effectiveness Shell script again wins the spot.