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Master's Thesis Specification

"CLI Tutor"

Introduction

Despite the arguably dated appearance, difficult learning curve and practical non existence in the general personal computing space, Command Line Interfaces (CLIs) have more than stood the test of time in the software development world. There are a multitude of extremely popular tools and applications that primarily focus on the command line as an interaction medium. Some examples include version control software like 'git', compilers and interpreters for programming languages, package managers and various core utilities that are popular in areas such as scripting and system administration.

As mentioned before,the use of command line interfaces has effectively disappeared from a mainstream personal computer usage perspective. This contributes greatly to the intimidation factor and learning difficulty for those interested in getting into software engineering or system administration. This paired with the inevitability of usage of CLIs in the development space highlights a need to make the command line more accessible to new users for whom text based interaction with their computer is an alien concept. In recent years interactive learning utilising tools such as sandboxed environments have been gaining in popularity and have the potential to be a suitable medium for learning command line basics through actual usage, examples and practice.

The goals of this Master's thesis

This thesis aims to create a forgiving shell like interface with the goal of teaching beginners basic CLI usage. The goal is to cover topics as shell scripting basics and Unix-like core utility usage through the use of interactive examples. The inspiration for this tool is form the 'vimtutor' [1] utility shipping along side the extremely popular terminal based text editor Vim. A secondary goal would be to wrap the shell learning tool in a web application in order to make it more accessible and portable. To validate the tool, a user study will be conducted, most likely with bachelor students at the University of Zurich.

Tasks

Literature review. A look into some of the existing work performed in this space, in order to ascertain what the core difficulties and issues that would need to be tackled are.

Outlining the curriculum. Deciding what lessons and examples the tutor utility should comprise of. This will be done by looking at existing learning tools, guides and through insights gained from the literature research.

Development of the forgiving shell. The task here is to implement a CLI or TUI interface that allows for mistakes and can gently guide the user toward a correct answer rather than producing intimidating or cryptic errors as using a traditional shell directly might do. The 'GoCui' library might be an appropriate candidate for building a tool such as this.

Validation Performing a user study in order to measure the effectiveness of such a tool.

Milestones

Deadline	What
March 1st	Official start of thesis.
March 8th	Literature review complete.
March 15th	First draft of curriculum completed.
March 21st	Curriculum defined.
March 29th	Development of tool begins.
May 31st	Review of tool & Decision made regarding Web based version.
June 7th	Validation and study defined and begun.
June 29st	Study completed.
July 5th	Analysis of findings completed.
July 31st	Thesis submitted and presentation completed.

Special remarks

Copyright. In accordance with current regulations, the student retains the copyright to his work, while providing a non-exclusive, non-revocable, time-unlimited license for it to the university. For this particular thesis, the student intends to keep all source code public so as to provide maximum accessibility to the proposed learning aid.

Responsible assistant: Dr. Carol Alexandru-Funakoshi

Signatures:

Student Name Qasim Warraich

References

[1] M. C. Pierce, R. K. Ware, C. Smith, and B. Moolenaar. vimtutor - the vim tutor, Nov 2019.