APPLICATION OF E-LEARNING IN PROGRAMMING LANGUAGES THEORY

Filip Goldefus, Ota Jirák

Brno University of Technology, Faculty of Information Technology
Božetěchova 2, 612 00 Brno, CZ

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Table of Contents

Contents

- Introduction
- Theoretical Introduction
  - Flashcard type of e-learning
  - SLD resolution and visualization
- Implementation
- Conclusion

Introduction

Basic goals of programming language e-learning course

- Dealing with inconsistency of e-learning methodology
- Creation of unified framework for e-course
- Exchange of information
  - Content-related exchange of information
  - Planning of tasks
  - Social support
- Creation of software appplication

Theoretical Introduction

Parts of software application

- Flashcard system
  - Memorization of information
  - Based on cognitive psychology models
- Vizualization of SLD resolution
  - Content dependent visualisation (Prolog, Haskell, . . .)
- Structure of software application
  - ER Diagram, Function diagram, Diagram of roles, . . .

Flashcard type of e-learning

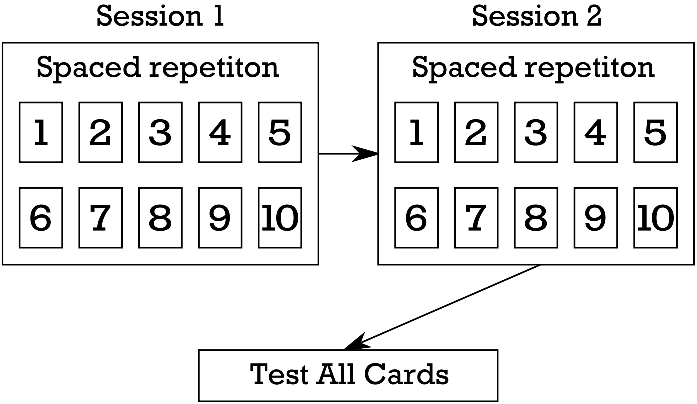
Description of flashcard system

- Repetition of (virtual) cards
- Based on methods for foreign language learning
- E-Course content is stored in *database of facts*
- *Database of facts is divided into lessons (by topic and by difficulty)*
- *Showing of cards based on difficulty*

Hypotheses behind flashcard systems

- Strength hypothesis
- Multiple-trace hypothesis

Example Diagram of Flashcard system



SLD resolution

Description of Selective Linear Definite (SLD) clause resolution system

- Visualisation of SLD clause revolution
- Visual completion of programming code

Informal description of SLD resolution:

- Every logical program consists of clauses
- Clause is set of literals
- Literal has logical value – true or false
- Two clauses resolves in another clause
- SLD resolution is visualized by tree

SLD resolution example

```
father_child(tom, sally).
father_child(tom, erica).
father_child(mike, tom).
sibling(X, Y)      :- parent_child(Z, X), parent_child(Z, Y).

?- sibling(sally, erica).
Yes

?- sibling(X, erica).
tom
```

Implementation

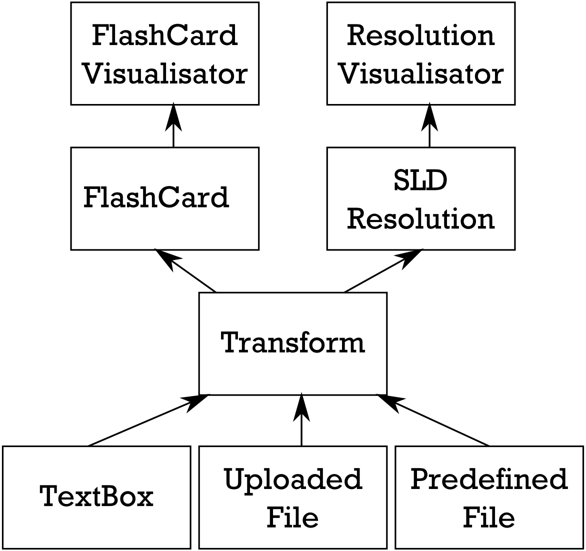
The whole system is divided into two main sections

- Flashcards
- SLD resolution visualization

The architecture is divided into several parts

- Predefined files
- Uploaded files
- Textbox

System Architecture



Conclusion

Completed parts

- Logic programming
- Flashcard

Future interests

- Experiments with flashcard application
- Evaluation of students progress
- Implementation of functional programming
  - Selection of functional programming language (Examples, . . .)
  - Description of theoretical preliminaries (Lambda Calculus, . . .)