Software Design Document: Sudoku Solver in Haskell

Neha M (B14113) | Siddhant Kumar (B14133)

May 2017

Sudoku Solver in Haskell
Design Document

Revision History

Version	Date	Author(s)	Description
v1.0	27/05/17	Neha M	Initial version
v1.1	28/05/17	Siddhant Kumar	Few changes in design

Table of Contents

1 Introduction

Sudoku solver, as its name implies, is a program which solves a sudoku puzzle.

1.1 Design Overview

The program uses haskell programming language. It accepts input in a particular format and displays the output on the ubuntu terminal. It uses 'GHC' compiler for haskell.

1.2 Intended Audience

This document is intended for expert haskell programmers.

1.3 References

[1] Hoogle, https://www.haskell.org/hoogle/

[2] Learn you a haskell for great good, http://learnyouahaskell.com/syntax-in-functions

1.4 Interfaces

The ubuntu terminal acts as an user interface here.

1.5 Algorithms and Data Structures

The algorithm used to solve the puzzle finds the possible values for every empty block in the sudoku puzzle. It assigns the values to those blocks which have minimum moves or minimum possible values (in most cases 1 possible value). The program makes use of various data structures of haskell namely lists and arrays.

It also uses specialities of haskell like -

1. 'type' definitions
2. '$' infix application of functions
3. '.' operator to combine any number of functions
4. lambda functions in haskell
5. 'map' and 'filter' functions
6. Backticks in functions

1.6 Test Scripts

The folder 'problems' contains all the test scripts on which the program is tested. These scripts contain unsolved sudoku puzzles written in a particular format. Currently the program accepts a 9*9 sudoku but the size of the sudoku can be changed according to the users' needs.

1.7 Running the program

Prerequisites –

1. GHC compiler for haskell

Running the program -

1. Compile the program using **'ghc --make solver.hs'** command.
2. After compiling run the program using **'./solver /problems/<filename>.txt'** command.
3. The input files in **problems** folder can be edited to include some other sudoku.