Project 2 Requirements

Abstract

The objectives, requirements, and relevant information for Project 2 are stated here. Submission of your files is done through the course website.

1 Purpose

The purpose of this project is for you to demonstrate the following:

Capabilities: Basic functional programming skills as evidenced by:

- Code solutions to Exercises 4.6.3, 4.6.4, 5.3.4, 5.3.5, and 6.2.1
- Session transcripts showing execution results of required test cases
- Explanations as required by each problem
- All source code for each exercise in the appendix

Use of Relevant Tools and Techniques: LaTeX, AUCTeX, emacs, and ML

Deliverables and Evidence: a pdf of your report with *all source files allowing others to reproduce your report, functional programs, and test results.*

2 Project Requirements

Your report shall have the content as illustrated by *Sample Report for Simple ML Example*. Your report will have the following content, in addition to the Title, Author, Date, Abstract, Acknowledgments, Table of Contents, and report chapters and sections covering:

Chapter 1: Executive Summary stating either

1. All requirements are satisfied with a summary of what was done, or
2. Some requirements are not satisfied due to incorrect or incomplete results, with a summary of what is satisfied, what is incomplete, and/or what is incorrect.

Chapter 2: Exercise 4.6.3 with the following sections

2.1 Problem Statement

2.2 Relevant Code

2.3 Test Cases

2.4 Execution Transcripts

Chapter 3: Exercise 4.6.4 with the following sections

3.1 Problem Statement

3.2 Relevant Code

3.3 Test Cases

Chapter 4: Exercise 5.3.4 with the following sections

4.1 Problem Statement

4.2 Relevant Code

4.3 Test Cases

4.4 Execution Transcripts

Chapter 5: Exercise 5.3.5 with the following sections

5.1 Problem Statement

5.2 Relevant Code

5.3 Test Cases

5.4 Execution Transcripts

Chapter 6: Exercise 6.2.1 with the following sections

6.1 Problem Statement

6.2 Relevant Code

6.3 Test Cases

Appendix A: Exercise 4.6.3 Source Code
Source code is input to the report using `\lstinputlisting`.

Appendix B: Exercise 4.6.4 Source Code
Source code is input to the report using `\lstinputlisting`.

Appendix C: Exercise 5.3.4 Source Code
Source code is input to the report using `\lstinputlisting`.

Appendix D: Exercise 5.3.5 Source Code
Source code is input to the report using `\lstinputlisting`.

Appendix E: Exercise 6.2.1 Source Code
Source code is input to the report using `\lstinputlisting`.

3 Relevant Information

3.1 Specific Tests

Exercise 4.6.3 Use the tests in ex-4-6-3Tests.sml

Exercise 4.6.4 Use the tests in ex-4-6-4Tests.sml

Exercise 5.3.4 Use the tests in ex-5-3-4Tests.sml

Exercise 5.3.5 Use the tests in ex-5-3-5Tests.sml

Exercise 6.2.1 Test cases. **Make sure you turn off unicode and turn on types for your sessions/transcripts!**

1. Enter the HOL equivalent of $P(x) \supset Q(y)$. Show what HOL returns. What are the types of x, y, P, and Q?
2. Consider again $P(x) \supset Q(y)$. Suppose we wish to constrain x to HOL type `:num` and y to HOL type `:bool`. Re-enter your expression corresponding to $P(x) \supset Q(y)$ and show that the types of x, y, P, and Q are appropriately typed.

3. Enter the HOL equivalent of $\forall x\ y.P(x) \supset Q(y)$, without explicitly specifying types. What do you get and why?
4. Enter the HOL equivalent of $\exists(x : num).R(x : \alpha)$. What happens and why?
5. Enter the HOL equivalent of $\neg\forall x.P(x) \vee Q(x) = \exists x.\neg P(x) \wedge \neg Q(x)$
6. Enter the HOL equivalent of the English sentence, *All people are mortal*, where $P(x)$ represents x *is a person* and $M(x)$ represents x *is mortal*.
7. Enter the HOL equivalent of the English sentence, *Some people are funny*, where $Funny(x)$ denotes x *is funny*.

3.2 Submission Guidelines

Deadline: check course website

Content & format: zipped file of your Project 2 sub-directory containing a pdf of your report and all source files allowing complete reproduction of your report

How submitted: through course website

Other information: you will be allowed an unlimited number of attempts to submit your files up to the deadline. Your grade is based on the last submission.

3.3 Grading Criteria

Deliverable Item	**Problem Statement**	**Relevant Code**	**Tests**	**Code in Appendix**	**Total**
Chapter 1: Executive Summary	4 points for summary	N/A	N/A	N/A	4 points max
Chapter 2: 4.6.3 (a)–(f)	1	6	6	1	14 points max
Chapter 3: 4.6.4	1	1	1	1	4 points max
Chapter 4: 5.3.4	1	1	1	1	4 points max
Chapter 5: 5.3.5	1	1	1	1	4 points max
Chapter 6: 6.2.1 (1)–(7)	1	7	7	1	16 points max
Appendices A–E	N/A	5	N/A	N/A	5 points max
Subtotal	9 points max	21 points max	16 points max	5 points max	51 points max
Folder with all necessary components to reproduce report and all ML results					51 points max
				TOTAL	102 points max