COMS 4115: Programming Languages and Translators
Project Deliverable #3: The Language Reference Manual

Due February 26th, 2018 at 11:59:00 PM
Richard Townsend, Columbia University

1   Background

A language reference manual (LRM) is the fundamental documentation for a programming language. It completely describes the syntax and informal semantics of a language, providing a user with all the information they need to write and understand a correct program. To get a sense of the style and composition of an LRM, peruse existing manuals for real-world languages (a few links have been provided on CourseWorks in the "Language Reference Manual" module).

You should strive for three qualities as you write your LRM: completeness, conciseness, and organization. Each will be discussed below.

Completeness   Each feature in your language should be presented and discussed (use code examples as needed to help explain less intuitive features). A "feature" is anything ranging from a lexical convention to a syntactic construct to a semantic implementation detail. One technique that will ensure you cover everything is to introduce (and include) snippets of your grammar from least to most complex, explaining both the syntax and semantics of the code admitted by each rule. Constantly ask yourself "does this description cover all possible cases of how this feature could be used?"

Conciseness   Aim for descriptions that are as small as possible while capturing all necessary information. For example one could describe the semantics of '+' in OCaml as either "integer addition" or "add the numeric results of two expressions of type int provided as arguments." The former should be your goal. However, be wary of ambiguity: simply stating that '+' is "addition" doesn't inform the reader of possible types of operands or the result.

Organization   The reader's understanding of your manual is directly affected by the order and structure of the topics discussed. The document should be broken into sections and subsections based on the general components of your language and their constituents. *Use different fonts throughout the LRM* to distinguish code from prose from grammar rules. In general, avoid using any language features in an example unless it was presented earlier in the LRM. In some cases this is infeasible or unnecessary. For the former, include references to the section where the feature is explained; for the latter, simply explaining what the new feature (that hasn't been explained yet) is doing is good enough.

2   Content Requirements

Your LRM should include the following:

1. An introduction briefly explaining your language and this document.

2. A small section describing hwo to read the notation in your manual (i.e., what should be understood as prose vs code vs grammar rules).

3. A complete description of each "thing" in your langauge. Both the syntax and semantics should be explained in some way.

4. Code listings for anything you plan to include in a standard library.

3   Rules and Regulations

- Submissions must be made via CourseWorks.

- Each group should submit a single .pdf file.

- All group members' names and email addresses should be included in the document.

4   Grading

To be graded, your submission must follow all the rules and regulations listed above in Section 3. We will use the detailed grading rubric provided on the CourseWorks assignment page for grading; here, we list the general criteria, total points allocated to each, and a description of how to successfully achieve full marks.

Criteria	Total	Description
Content	50 pts	All syntax and semantics of your language are presented and explained. No inconsistencies arise in the manual.
Organization	30 pts	Document is well-organized; code and prose are clearly distinguished
Writing	20 pts	Document has been proof-read, checking for spelling and grammar errors