COMP 325 - Language Research Project

13 September 2019

You'll be carrying out some research on a language of your choosing. Towards the end of the semester you'll be presenting your language and your findings to the "class".

1 The Research

For your language of choice you must be prepared to present and discuss the following topics:

- History and background

- Language syntax and semantics

- Language pragmatics

1.1 History and Background

A good chunk of your research should address the history and background of your chosen language. This includes:

- Brief history of the Language

- Who developed the language and why

- Who used/uses the language and why

- What languages are related to it and how

- Any well known projects/programs that were implemented using the language

This is the non-technical portion of the report. The main goal of this section is for you to paint the picture of why this language exists and why, as students of programming and computing, we should be interested in it.

1.2 Language Syntax and Semantics

This section should delve into the nuts and bolts of the language. More specifically its syntax, semantics, and pragmatics. Things to look at include (but are not limited to):

- Is it declarative, imperative, or somewhere in between?

- What concepts and paradigms does it support? For example:

    - State and named state
    - Records/indexed data structures
    - Objects
    - Lexically-scoped closures
    - Laziness/lazy evaluation

- – Types and variable typing
- – Recursion and tail-call optimization
- – Garbage collection

To help facilitate this analysis, provide code examples whenever possible. Be certain to cite any examples that you pulled from one of your sources.

1.3 Language Pragmatics

This research covers current or past best-practices for development with your language. Look at things like,

- Tools available for the language (Compilers, interpreters, IDEs, etc.)

- Documented style-guides and language idioms

Your goal is to establish how one effectively and efficiently utilizes your language in practice.

2 Logistics

1. **Due 10/09** *Annotated Bibliography* Your bibliography should include official documentation, general sources on the language's history and background, as well as information about notable projects. It may also include third-party references and source code. Somewhere in the document you should discuss the credibility of each source. *Turn in a printed copy by the due date. This counts as a homework grade.*

2. **Due 11/26** *"Quicksort" Paper* Your paper should broadly cover the syntax, semantics, and pragmatics of your chosen language as discussed above. To keep things from being too general and vague, the focal point of your paper should be the technical presentation of Quicksort, **or some suitably complex algorithm**, in your language. This is not a paper only about quicksort in your language. This paper should be about the *language* and Quicksort is your concrete example from which you draw out key points about syntax, semantics, and pragmatics.

   In the past, papers of around 5 pages (give or take a few) have been most effective, but there is no strict minimum or maximum – use as many or as few pages as you need to express the points you think are important.

   Submit a printed copy of the paper to the instructor and email a digital copy to the class. You will be peer-reviewing your classmates' papers for homework.

3. **12/03** *Final Presentations*

   You will make a 15 minute, in-class presentation about your research. This time should include a few minutes for questions.