

CSci 4651 Fall 2008  
Problem Set 11, optional, up to 25 points: study of programming  
languages design.  
Due December 17 at 5pm

You need to write a short (2-4 pages double-spaced or equivalent) case-study of programming languages. You have three options to choose from:

- To compare two existing programming languages.
- To describe in detail an existing programming language which we have not studied in class. The ones that we have studied are Scheme (LISP), OCaml (ML), Ruby, C++, and Java.
- To write a brief proposal for a new programming language that you think would be an improvement over existing ones. You need to explain why this language is an improvement. Be specific about the intended usage of the language.

The languages that you consider (or design) must be general-purpose languages, i.e. it should be possible to write a substantial and sufficiently general program in the language without the need to use another language.

You need to address the following aspects of the language(s):

- the main programming paradigm or a combination of paradigms (imperative, functional, object-oriented, etc.)
- type discipline: is the language “more” typed or “less” typed (whether types have to be declared by the programmer, how flexible the type system is, such as allowing to combine data of different types in an array/list, etc.)
- static vs. dynamic type system (or a combination?)
- support for type polymorphism (can you write a function that works for different types? Does the language support parametric types, such as Java generics or C++ templates)?
- is the language object-oriented? What is its inheritance model and how does it relate to subtyping?
- mention unusual features of the language, if any.
- what type of applications is this language used for? What are its strength and weaknesses? Please justify your answer to this question by the information above

The paper will be graded based on the quality of addressing the above questions, justification for your answers (you need to reference your sources or use your personal experience), and the clarity of writing.