

CSCE 314 [Sections 501, 502] Programming Languages – Fall 2017

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Assignment 1

This assignment must be done individually.¹

Assigned on Monday, August 28, 2017

Due dates: Electronic submission of *yourLastName-yourFirstName-hw1.tex* and *yourLastName-yourFirstName-hw1.pdf* files of this homework is due on **Monday, 9/18/2017 before 23:59** on <http://ecampus.tamu.edu>. You will see two separate links to turn in the .tex file and the .pdf file separately. Please do not archive or compress the files. **If any of the two files are missing, you will receive zero points for this homework.**

Name: (type your name here)

UIN: (type your UIN here)

On my honor, as an Aggie, I have neither given nor received any unauthorized aid on any portion of the academic work included in this assignment. Furthermore, I have disclosed all resources (people, books, web sites, etc.) that have been used to prepare this homework in the acknowledgements and the reference sections.²

Electronic signature: (type your full name here)

Problem Statement. In this assignment, you will do some research on different programming languages. Choose any eight languages of your interest from the list below, as well as Haskell and Java, ten in total.

- | | | |
|------------|-------------|---------------------|
| 1. FORTRAN | 9. FP | 17. X10 |
| 2. LISP | 10. ML | 18. Fortress |
| 3. Scheme | 11. Miranda | 19. Scala |
| 4. ALGOL | 12. SQL | 20. Ruby |
| 5. BCPL | 13. Eiffel | 21. Perl |
| 6. C | 14. C++ | 22. Matlab |
| 7. SIMULA | 15. Python | 23. Haskell* |
| 8. Prolog | 16. C# | 24. Java* |

* Haskell and Java are required.

Write a survey report explaining the salient points of each of the ten languages (in Section 2) classifying and comparing them, such as how some of the languages are related, how they differ, how one improves on another, and so on, regarding some characteristic categories (in Section 3) (more details are below). There are 100 points in total for this assignment.

This is an open-ended assignment. Choose languages that you may have not heard of, or would like to know more about. There are also many different subtopics between all of the above languages that you need to write about as well, again, find the ones that interest you the most. Your report must be at least five (5) and at most seven (7) single-spaced single-column pages

¹This assignment is an *individual* assignment, not a team-based effort. Discussion of concepts is encouraged, but actual write-up of the report must be done individually.

²Remember always the Aggie Honor Code. Do not simply cut-&-paste sentences from the web! Also, do not make small variations to texts written by others and pass it off as your own work!

using 11-point size font on 8.5×11 inch (letter size) pages (starting from Section 1 Introduction to Section 4 Conclusions, without including acknowledgements and references).

The following structure is required of your report, i.e., each section number and the given section title must be *explicitly present* in your report. Also, the distribution of the 100 points is shown below. Carefully read the explanations given below and write a high-quality report. Grading will be based not only on quantifiable measures (e.g., whether ten languages including Haskell and Java are researched) but also on the quality with which it is written. Furthermore, how much penalty will be applied in the case of not adhering to the page limit is at the discretion of the person who grades it.

1 Introduction (10 points)

One to two paragraphs of introductory statements, such as motivation and justification on why you chose those languages and classifications.

2 Salient Points of Each Language (30 points)

Explanation of the salient points of each language in two to three paragraphs per language. Include what the purpose of developing the language was and what the main usage of the language is/was. It is suggested that you use subsections to designate different languages. Here is an example for a language description:

2.1 Whitespace

Whitespace is a language developed as a joke, in 2003, by Edwin Brady and Chris Morris. Whitespace only assigns meaning to whitespace characters (space, tab, and linefeed). The language is imperative and stack based. Because whitespace ignores all non-whitespace characters, it can be embedded to almost any other language—most languages ignore whitespace. [1]

Many interpreters, compilers, editing modes, and other tools for Whitespace are available in the project homepages of the language. The language is Turing complete, and among other things, an interpreter for Whitespace written in Whitespace is available.

At least part of the inspiration to develop the language presumably came from Stroustrup's article on overloading whitespace in C++ [2].

3 Classification and Comparisons (40 points)

This section contains detailed explanation of comparisons of the languages according to some categories (at least two different categories), for example, programming paradigm, purpose, abstraction technique, compilation technology, error/exception handling, strong/weakly typed, memory management, efficiency, argument passing methods, and so on. Feel free to do research on different categories, elaborate within the categories, and/or propose an improvement of a certain language regarding its techniques and paradigms. It is suggested that you use subsections to designate different categories.

4 Conclusions (10 points)

One or two paragraphs on your findings and what you learned by working on this report.

5 Acknowledgements

Acknowledge all the persons from whom you received any help while working on this report.

References (very important!) (10 points)

References are of utmost importance! Disclose all resources (articles, books, web sites, etc.) that you used to prepare this report. Make sure that every reference/resource you put in this section is correctly *cited* within the text in Sections 1, 2 and 3. If you just list references without citing them in the text, then points will be deducted not only from the references portion but also from Sections 1, 2 and 3, since your claims in those sections lack credibility.

How to do bibliography generation and inclusion is explained in [3] and [4], for example. The reference section below is generated using the “thebibliography” environment (see the L^AT_EX source file of this PDF document).³

References

- [1] Edwin Brady. Whitespace tutorial. <http://archive.is/iBJxT>, December 2015.
- [2] B. Stavtrup. Overloading of C++ whitespace. *Journal of Object-Oriented Programming*, April 1st 1992.
- [3] Tobias Oetiker *The Not So Short Introduction to L^AT_EX 2 ϵ* , Section 4.2. Available from <http://faculty.cse.tamu.edu/hlee/csce222/lshort.pdf>
- [4] Bibliography management with bibtex. https://www.sharelatex.com/learn/Bibliography_management_with_bibtex

³You could use bibtex with a separate .bib file, but that involves another step.