

Course Project

Implement an interpreter for the language of Typed Arithmetic Expressions with extensions (additional set of terms). The submissions are to be done in stages as given below:

1. Submit a two page report giving your plan of implementation. The report should indicate the language chosen, tools required and other relevant details. There should be a reference section listing the materials that you have read. Evaluation may consist of a viva-voce. (Maximum marks: 6)

Submit the report on or before 27.10.2021, 11.55 p.m.

2. Develop the interpreter for the language of Typed Arithmetic Expressions. At the time of evaluation, you will be asked to submit a report giving some of the details of the implementation. (Maximum marks: 6)

Evaluation will start on 28.10.2021

3. Implementing the interpreter for the extended language. The formal syntax, semantics and type system for the extensions will be given to you at the time of evaluation. You have to complete the implementation within the given time slot (maximum 2 hours). (Maximum marks: 8)

Evaluation on 01.11.2021 (tentative)

Term Paper

In the course, we learnt to write the Formal Semantics and Type System with the language of *Typed Arithmetic Expressions* as an example. For the term paper, you have to conduct a study of the semantics and type system of a practical programming language. Prepare a report summarizing your study including the semantics of the various constructs in the language, type system in the language, properties of the language based on the semantics and properties of the type system. Include your own observations and comments related to the properties. Formal specification of the semantics of at least three constructs in the language should be given. The type system specification should consist of the set of types and at least three typing rules. You have to give a presentation of maximum 10 minutes. (Term paper: Maximum 15 marks. Presentation: Maximum 5 marks)

Submit the term paper on or before 27.10.2021, 11.55 p.m.

The report should consist of 4-6 pages (preferably typeset in latex - article class with 10pt font size). Give the following details in the beginning of the report:

- Title
- Author details
- Abstract (one paragraph)

The content may be divided into the following sections/subsections in the given order

1. Introduction
2. Literature Survey
3. Language Definition
4. Semantics
 - 4.1 Formal specification (for at least 3 constructs)
 - 4.2 Properties
5. Type System
 - 5.1 Formal specification (set of types and at least 3 typing rules)
 - 5.2 Properties
6. Conclusion
7. References (at least 5)

The presentation will be **scheduled from 28.10.2021 onwards**. A brief overview of your study may be given in the presentation. Maximum time for a presentation will be 10 minutes. You may prepare 10-15 slides (including title and references), summarizing the report contents.