Studying link-time optimizations in programming language development to facilitate the continuum of static and dynamic modules.

David Callanan

21444104

Final Year Project – 2026

B.Sc. Single Honours in Computational Thinking

Department of Computer Science

Maynooth University

Maynooth, Co. Kildare

Ireland

A thesis submitted in partial fulfilment of the requirements for the

B.Sc. Single Honours in Computational Thinking.

Supervisor: Dr. Phil Maguire

Contents

1 Parsing Library

Prior to this project I had already developed a simple parsing library in JavaScript, which allows for:

(1) Parsing terminal rules using regular expressions.

(2) Forming non-terminal rules by combining other rules in the following ways, sufficient to develop any complex grammar:

    (1) “or” making rule optional

    (2) “join” sequencing rules

    (3) “multi” repeating rules zero or more times

    (4) “opt” making rule optional

(3) Map parsed data to custom structures using the “mapData” function.

In addition it was necessary to implement a trace system to debug issues with parse rules.