Initial Project Proposal - Integration of RXXR2 into Eclipse

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1 Introduction

The motivation for pursuing this project came from my interest in static analysis of code. As a side project I am developing `Grafo` a Graph-based Software Quality Analysis tool (`https://github.com/Shabaka/grafo`). This project uses graph theory concepts to assess the quality of a given codebase (in Python at the time of writing).

Reading the "Static Analysis for Regular Expression Exponential Runtime via Substructural Logics" paper up to test cases in section 4, gave me a theoretical background on the phases of the analysis (prefix, pumping and suffix).

In addition to developing the integration of `RXXR2` in Eclipse it would be useful and interesting to integrate a graph-based software quality analysis tool. This will provide the developer with insights on their codebase (this will be a side objective for the project, i.e. a subset of the specification of `Grafo`).

The OCaml codebase will be ported to Java using the idioms and optimisations of Java.

2 Initial list of tools

The tools which will be used are:

- Eclipse PDE (Plug-in Development Environment)
- `RXX2` paper
- Grafo specification (for the side objective)

3 Initial reading list

The initial reading list during the summer 2017 will be as follows (with amedments):

- `RXX2` paper

- Backtracking in regular expressions
- Models of Computation material (for pre-theoretical background)
- Regular expression matching (`https://swtch.com/~rsc/regexp/regexp1.html`)
- Thompson construction

4 Conclusion

Prior to the Autumn Term I will be compiling a weekly log of the progress of reading and update the reading list in order to prepare for the literature review. This will be hosted on GitHub.