

# Java Pedagogical Libraries

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As computer science classes grow in size and virtual instruction becomes more commonplace, demand is increasing for methods of efficiently assessing student code at scale. In response, Gusukuma and Bart created the open-source Python library PEDAL (PEDAgogical Library). We aim to begin development of JPEDAL, a port of PEDAL into Java for use with Java source files. We start with the CAIT (Capturing AST-Included Trees) module for searching for structural patterns in student submissions. The procedure resembles regular expression matching, but it acts on ASTs (abstract syntax trees) rather than strings. We make use of the recursive matching algorithm detailed in previous writings on PEDAL. We use conventional software development tools (text editors, version control) and the principles of modular software design to produce the code. As of writing, the core functionalities are planned and documented but remain to be fully implemented. The library can parse source code into AST nodes and run simple equality comparisons between nodes. When complete, this project will serve as an open, publicly-available tool to reduce instructor workload when providing feedback for many student submissions. For future work, the other modules of PEDAL may be ported to Java, which may eventually contribute to a language-agnostic syntactic analysis backend for use in both pedagogy and programming language theory research.

Keywords: Java, syntactic analysis, abstract syntax trees, computer science education

