The goal of this assignment is to apply the loop invariant removal optimization to the code generated in MP3. To this end, you need to perform data flow analysis to compute reaching definitions. You can apply the optimization directly to the jasmine code, to any low level intermediate code that you may have generated for MP2, or to the abstract syntax tree directly.

Then, you should develop a good test suite to test the correctness of your implementation and to evaluate the effect of the optimization in terms of performance improvement. For performance improvement make sure your code implements a real algorithm, not an artificial computation created just for the purposes of making your optimization look good. As was the case for MP3, the test suite will be part of the evaluation.

**Handin Instructions**: You should e-mail the instructor a tar file with the code and test suite by 8 am on Dec. 14th. Also, you should schedule a ½ hour meeting Dec 14-16 with the instructor to evaluate your work (A sign up sheet will be made available during class). For the meeting, you should prepare a few slides where you

1. describe the overall organization of your compiler
2. the algorithm you used for parsing, code generation, and optimization and
3. show the performance improvements (if any) obtained by the optimization.

We will prepare several codes that we will ask you to run in order to test the correctness of your code generation and optimization.