Discussion questions for *OptiML: An Implicitly Parallel Domain-Specific Language for Machine Learning*

Comp 150PLD

November 19, 2014

1 Warm-ups

1. What is the domain of OptiML?
2. What are the design goals of OptiML?
3. Describe the challenges of building typical machine-learning applications using C++ or MatLab.

2 Design Evaluation

1. What abstractions and features does OptiML provide?
2. Explain the code in Section 2.3, both what it does and the OptiML features that it uses.
3. What features of OptiML contribute to portability?
4. What features of OptiML contribute to the generation of highly efficient code?
5. Describe how OptiML is implemented.
6. How did the authors evaluate the design of OptiML? How could the evaluation be improved?

3 Evaluating OptiML as a Domain-Specific Language

1. What are the advantages and disadvantages of embedding OptiML in Scala?
2. Describe OptiML's type system. How does it contribute to the goals of the language?
3. Describe OptiML's runtime system. How does it contribute to the goals of the language?
4. Does OptiML have or could it benefit from OptiML-specific libraries? Explain.
5. Does OptiML have or could it benefit from OptiML-specific tool support? Explain.
6. Discuss to what extent OptiML is a DSL.
7. Do you think the language achieves its goals?
8. How might the design be improved?
9. Do you like the language? The paper?

4 More detailed questions.

These might help you answer the questions above or guide your understanding of the paper.

1. Be able to explain the various OptiML code fragments in the paper.