

14

Building a Runnable Program

14.9 Exercises

- 14.12 Compare and contrast Diana and GIMPLE with each other and with the notation we have been using for syntax tree attribute grammars (Section 4.6).
- 14.13 (a) PC-relative branches on the MIPS are limited to an offset of $\pm 2^{17}$ bytes with respect to the current instruction. Explain how to generate position-independent code that needs to branch farther than this.
(b) Displacement on the MIPS is limited to an offset of $\pm 2^{15}$ bytes with respect to the specified base pointer. Explain how a dynamic library in the style of Figure ©14.15 can access more than 2048 symbols.
- 14.14 In Example ©8.66 we described how the Gnu Pascal compiler for the x86 uses dynamically generated code to represent a subroutine closure. Explain how a similar technique could be used to simplify the mechanism of Figure ©14.15, if the MIPS allowed instructions to be fetched from writable memory.

