

The Elements of Computing Systems

1 Hardware

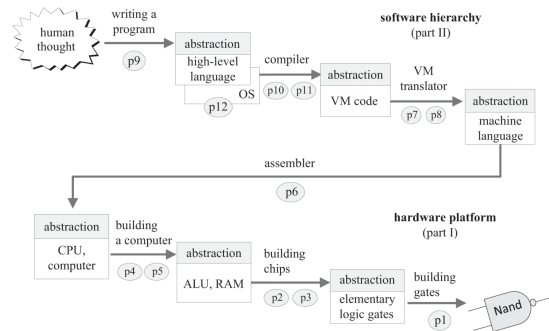


Figure 1.1 Major modules of a typical computer system, consisting of a hardware platform and a software hierarchy. Each module has an *abstract view* (also called the module’s *interface*) and an *implementation*. The right-pointing arrows signify that each module is implemented using abstract building blocks from the level below. Each circle represents a Nand to Tetris project and chapter—twelve projects and chapters altogether.

图 1. Nand to tetrid road map

modular design: the human ability to separate the problem at hand into an elegant collection of well-defined modules, each having a clear interface, each representing a reasonable chunk of standalone implementation work, each lending itself to an independent unit-testing program.