

How does the come to life?

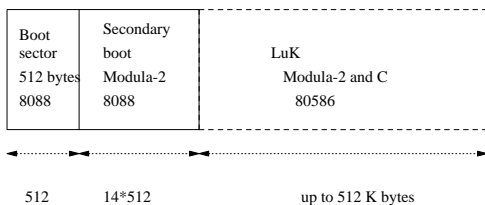
- the consists of a collection of Modula-2 modules
- the modules required for laboratory 1, 2 and 3 are different
 - when you compile using `make` the `makefile` is analyzed and a module dependency list is created
 - this list of modules is compiled and linked. An executable file is created (`exe`).
- this executable is an `i586` executable and contains data, code and symbol information.
- the `i586` needs to be made part of a boot floppy

How does a floppy boot disk work?

- a bootable floppy disk operates in the following way
 - once the PC has been reset the BIOS will attempt check so see whether a floppy disk is in drive A:
 - (providing the BIOS allows it to boot from the floppy disk drive)
- if a floppy disk is present then it reads the first 512 bytes (the first sector) into memory at location `07C00H`
 - the BIOS then jumps to location `07C00H`

Overview of the boot stages

- three boot phases
 - *primary* boot stage (boot sector, 1 sector, assembly language)
 - *secondary* boot stage (up to 14 sectors 8088 small mode Modula-2)
 - (up to 512K of `i586` code, Modula-2)



boot disk

- 512 bytes boot sector is small! Just enough space to place an assembly language program which loads in a larger program
 - loads in *secondary* boot stage at `90200H`
 - jumps to `90200H`
- *secondary* boot stage
 - consists of limited amounts of assembly language
 - most of the code is written in Modula-2 but compiled to small mode 8088
 - the secondary stage may be up to 14 sectors in size (14 * 512 bytes)

Secondary boot stage

Boot

- purpose of *secondary* boot stage is to load in your i586 code as quickly as possible
 - it uses whole track reads whenever possible (fast)
 - the *primary* boot stage only used single sector loads (slow)
 - it loads your Modula-2 i586 executable into location 10000H
 - collects vital statistics about the PC (how much memory the PC contains and where video memory starts)
 - saves this information
 - turns the floppy disk motor off

- finally *secondary* boot stage puts itself into 32 bit mode and calls your i586 code