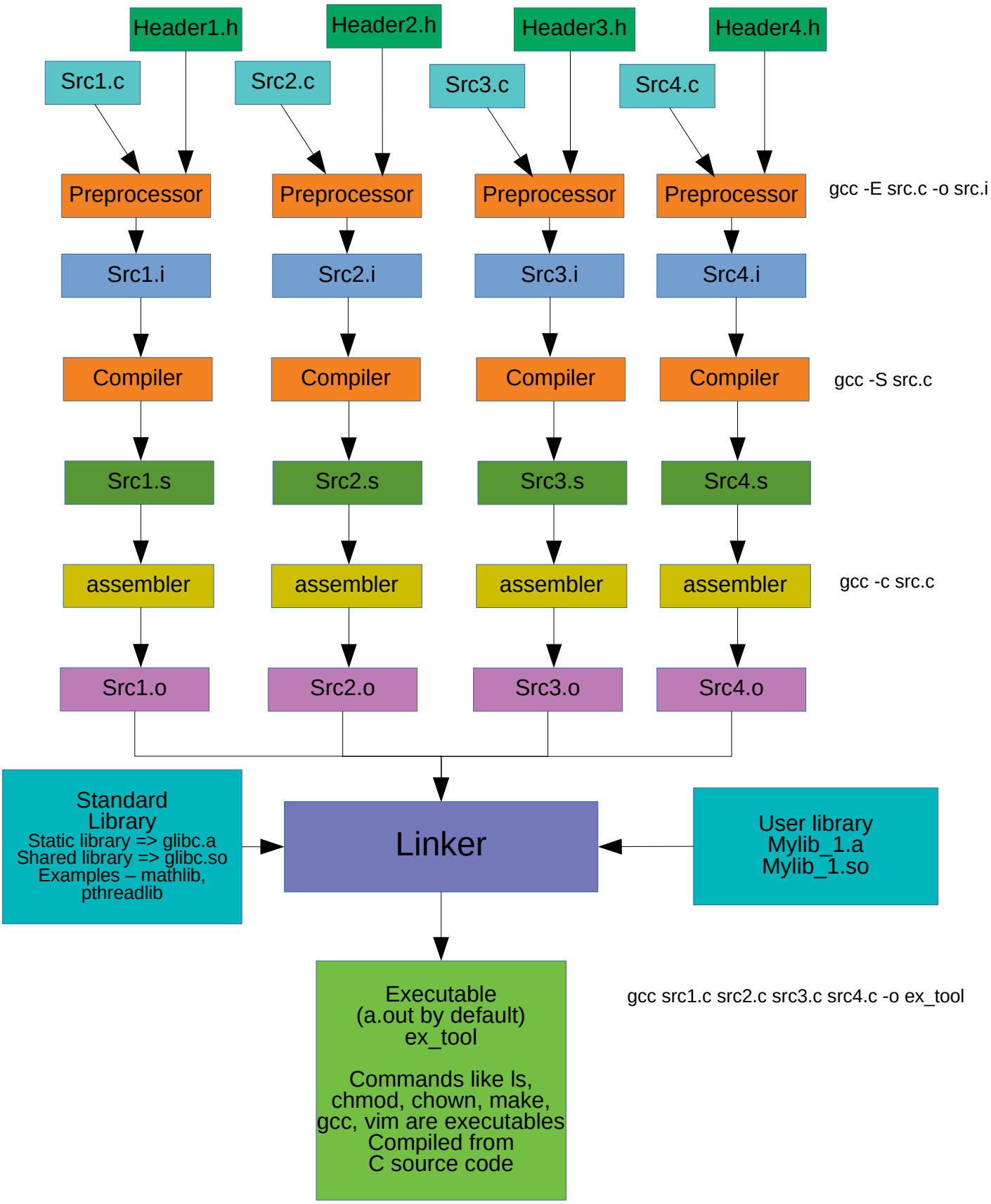
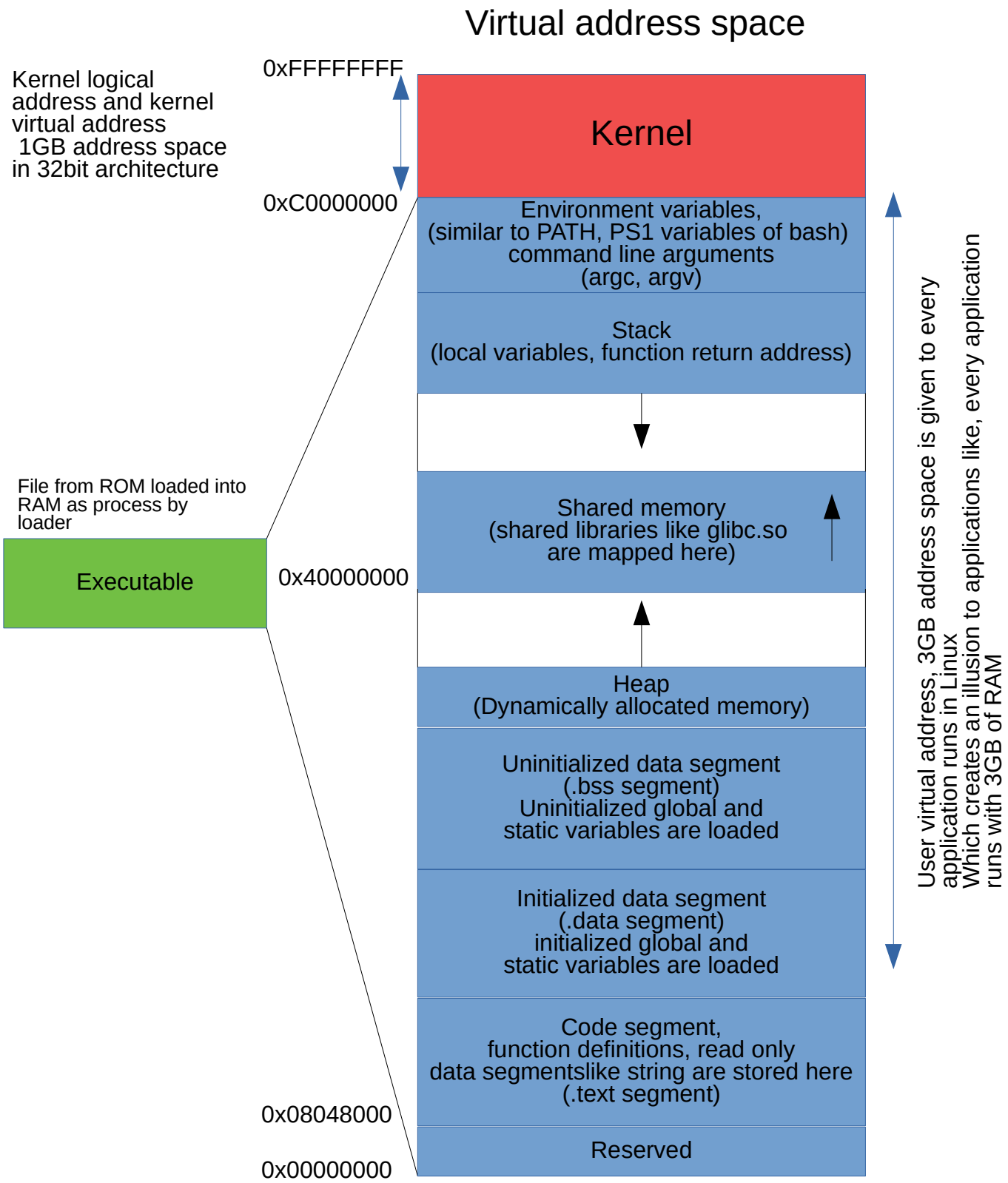
C language code Compilation

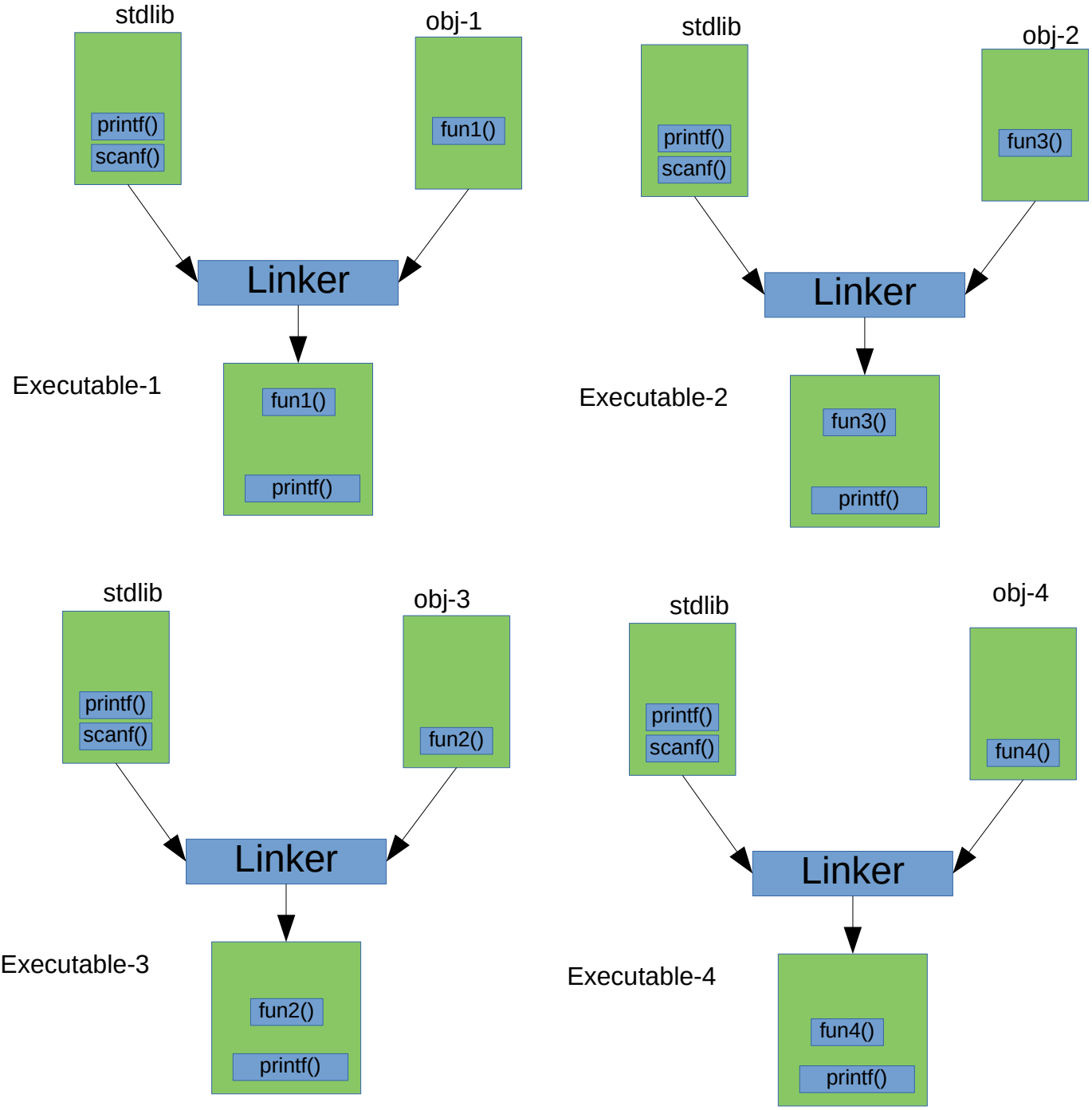


Applicatoin Loaded on Virtual address space (32bit arch)



Static Library

After linking with static library, every executable will have its own copy of the function which is linked, example printf as shown below.



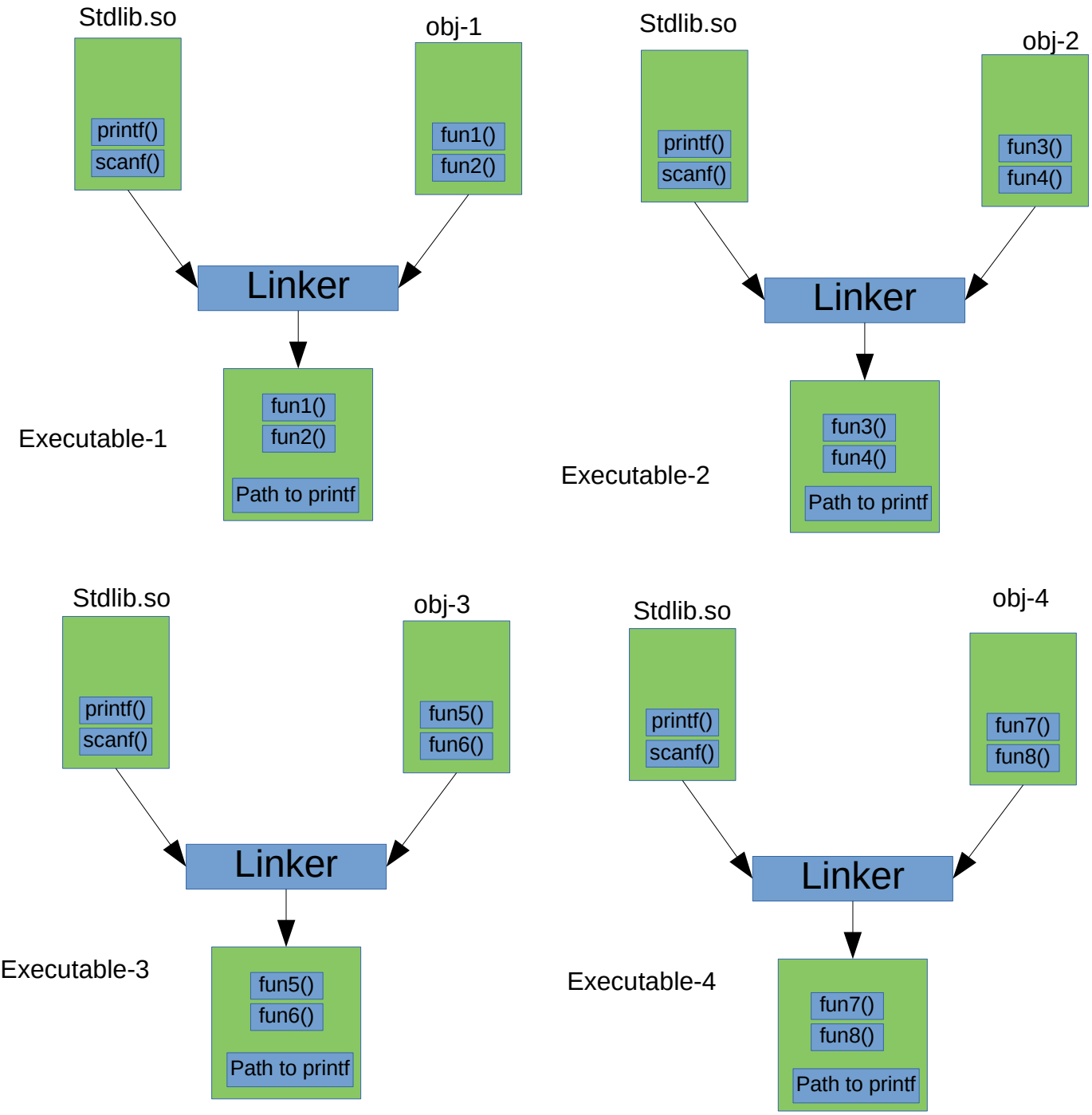
While loading the executable in RAM, every process will have its own copy of printf.

Advantages:
process will have seperate copy of its library functions, so loading is simple. Time to load will be less.

Disadvantages:
Multiple copies of function is available in disk and in RAM which consumes more memory and disk usage.

Shared Library

After linking with shared library, every executable can see a copy in its virtual address space.



While loading the executable in RAM, every process will have virtual address of printf loaded in RAM.

Advantages:
Process will have shared library functions, so loading time is less compared to the process with statically linked.
Only once library has to be loaded and then library has to be shared with other processes.

Disadvantages:
Executable generation needs extra effort, as the concept is bit complex.
Symbols are resolved dynamically, which takes extra effort.

Processes linked with Static Library