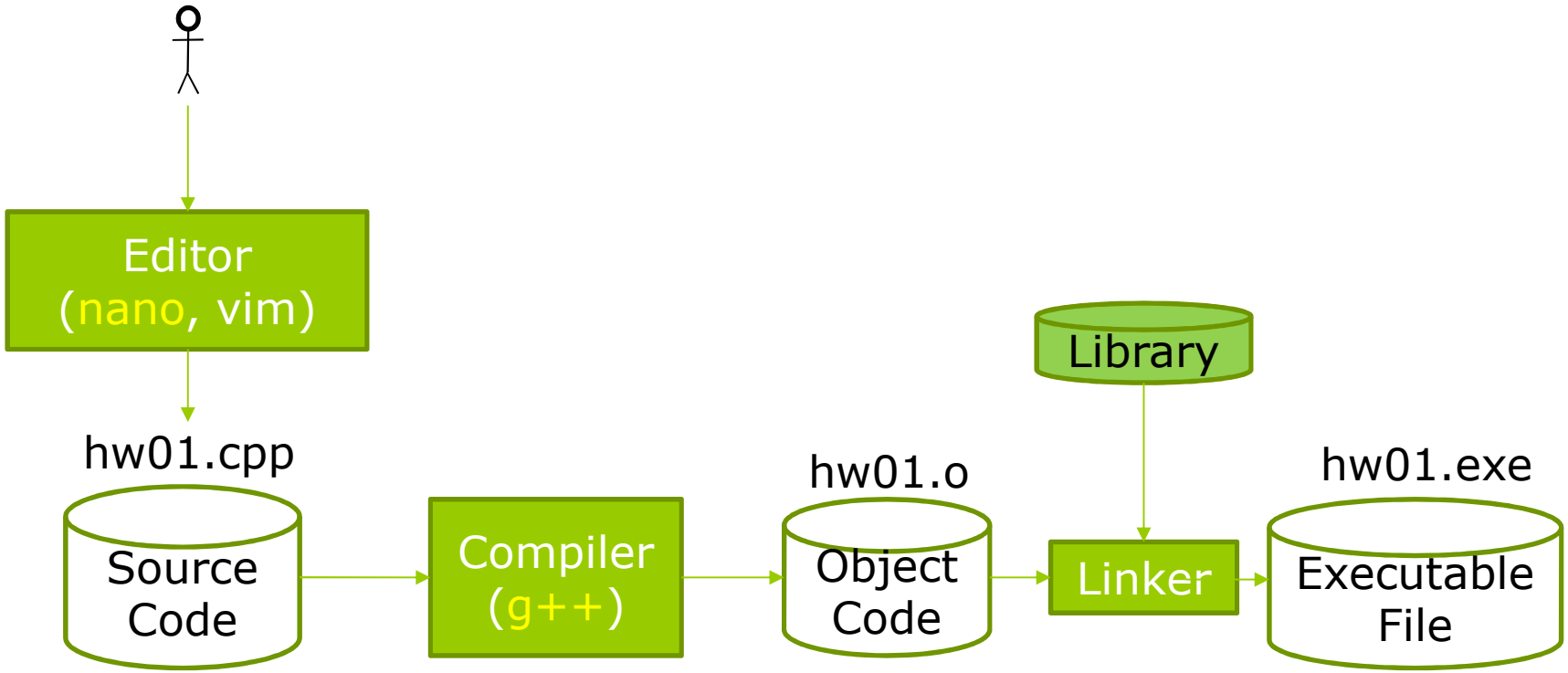
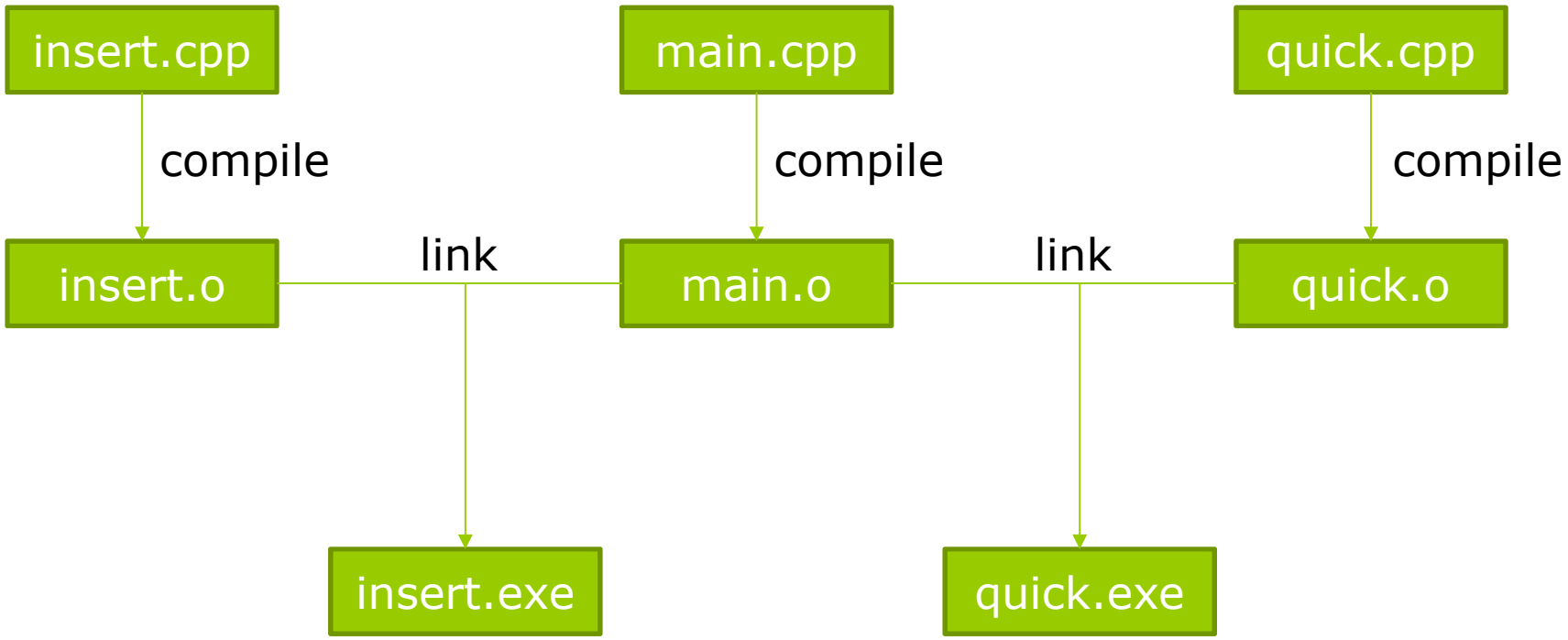
Building an Executable File




```
nano hw01.cpp
g++ -c hw01.cpp
g++ hw01.o -o hw01.exe
```

Object Files Can Be Shared




```
g++ -c main.cpp
g++ -c insert.cpp
g++ main.o insert.o -o insert.exe
```

```
g++ -c quick.cpp
g++ main.o quick.o -o quick.exe
```

What files should be re-generated?

- If you modified insert.cpp, then insert.o and insert.exe must be re-generated.
- If you modified main.cpp, then main.o and both insert.exe and quick.exe must be re-generated.
- It would be nice if your computer can automatically detect which source files are modified, and determine which target files must be re-generated.

Makefile

The first is the default target.

```
all: insert.exe quick.exe

main.o: main.cpp
        g++ -c main.cpp

insert.o: insert.cpp
        g++ -c insert.cpp

quick.o: quick.cpp
        g++ -c quick.cpp

quick.exe: quick.o main.o
        g++ quick.o main.o -o quick.exe

insert.exe: insert.o main.o
        g++ insert.o main.o -o insert.exe

clean:
        rm *.o *.exe
```

target

source

rule to generate the target

tab instead of space

```
make insert.o
make insert.o
make quick.exe
make clean
make all
make clean
make -n insert.o
make
```

dry run

You only need to prepare a CPP file

- In the exercise of "Sorting with Linked-List" (https://moodle.ncnu.edu.tw/mod/assign/view.php?id=884547):
  - TA will prepare the following files:
    - listElement.h
      - This file will be included by main.cpp, printList.cpp, and your 112321000.cpp
    - main.o
      - g++ -c main.cpp
    - printList.o
      - g++ -c printList.cpp
  - You will submit your program 112321000.cpp
    - TA will compile it by "g++ -c 112321000.cpp".
    - Then it will be linked with other object files to generate an executable file:
      - g++ main.o printList.o 112321000.o -o 112321000.exe