1. For each of the tools introduced in this lab, *use your own words* to describe each and what they can be used for. Answers that are cut and pasted from the documentation will not receive credit.

Objdump: shows info about object file with options to decide which part of info to display, -t shows symbol table;

Shared object files (.so): automatically linked when compiling the program and run executable file; and store as a separate file;

nm, llvm-nm, readelf: shows the information(memory address, type) about symbols within executable file, if object is not linked or be dynamically compiled, it won't show the address;

ldd: displays shared object(shared library) and location of the matched object, which can be used to check if linker error exists, in other words, check if link successfully.

environment variable: global variable used in system configuration settings, can be import, modify and export for customized use.

2. In your own words, what are the advantages (and disadvantages) of linking libraries into our programs.

advantage:
1. since shared library is stored in separate file, once it's loaded into memory, it's shared by all processes, thus reducing virtual storage consume; if multiple programs are accessing same shared library, it also reduces the size of executable files and save disk space;
2. if shared library is already in memory, then reducing load time;
3. better run time performance since reduce page faults(os tends to keep shared library used by multiple applications)
4. dynamically linked when program is loaded, enabling automatically adjust changes without recompiling.

disadvantage:
1. mostly slower than statically linked;
2. less locality benefits, need to visit more pages;
3. easily affected by the shared library, if shared library is changed or removed, program would also need change, or stop working.