Week 3 Topics:
Current Operating Systems, “Open” VS. “Closed” source, and DOS

Before class read these questions over. Complete them in class as time permits and finish them in the current week. If you don't understand a question, ask for clarification in class. Questions from quizzes will form the bulk of the midterm and final exams.

1. What is open source software? "Open source software is software who's source code is available for modification or enhancement by anyone." - opensource.com

2. What are some risks and benefits of open source software?

Sometimes gets abandoned	Often "free" to download and distribute
Occasionally slow development lifecycle	Easily accessible
Potential legal issues (IE: Nobody to sue if something goes wrong)	Highly customizable for more specific projects
	Occasionally highly innovative
Sometimes limited support	Good place for new programmers to learn the skills
Occasionally lower-quality than proprietary options	Often highly collaberative

3. What are some risks and benefits of closed source software?

Sometimes Expensive	Sometimes highly "polished" product
Customizations need to be built-in	Often well supported with help-desks and documentation
Legal issues over licensing	
Market driven	Market driven
Often fewer people looking at / vetting the code	Sometimes more focused product development

4. Which is more “secure” - open source or closed source software? Both have risks and benefits
   Why? Security is often measured in terms of how many eyes have been on the source code or how few people know about any cryptographic algorithms in the program. However, this point has become rather moot as both sides have seen lax security practices (IE: Heartbleed / Microsoft Internet Explorer "Use after free" exploit) of the last couple of years.

5. Would open source anti-virus software be a security risk? No / Yes Why or why not? Detecting malware involves pattern matching algorithms to known virus fingerprints, and these "virus definitions" are not usually proprietary information. / Knowing how the anti-virus software launches and runs, a malicious attacker could attempt to suspend or deactivate the virus scanning engine.

6. What are some primary differences of open source vs closed source software? Closed source software often has a price tag, strict rules surrounding licensing and distribution, and cannot be modified without reverse engineering.

7. Where do open source and closed source fit in our society? Open source is a good fit for education and projects requiring a high degree of customization. Closed source is often a better fit for situations requiring standardized environments, especially with outside organizations.

8. Which is more valuable? Open source / Propietary Why? Open source fosters innovation and collabortion potentially improving the future of software technology. / Closed source can support more dedicated development potentially bringing new innovations to production sooner and with a higher level of polish.

9. Which Microsoft operating system product offered a "subscription" version? Windows XP

10. Name an O/S manufacturer who uses both open and closed source software in its O/S. Novel (Suse), Apple (Though, technically, they're a hardware company that makes its own operating system), Solaris 10

11. Does closed source software need more tech support than open source software? No - not usually

How might your answer relate to us knowing or not knowing what is inside the box? Reputation.

Software that is full of "bugs", poorly designed, poorly implemented, or not well known, often requires more support.

12. Given that both closed source and open source software ideals have proven effective both in economic terms and intellectual (i.e. Microsoft vs Red Hat), if you had unlimited resources (time, money, etc.) which would you choose to use? Open source / Linux Why? My own familiarity with UNIX/Linux systems. A preference for the ability to customize the desktop through chosing a different window manager package.

13. What are three strengths and weaknesses of DOS?

Small Footprint	Single tasking
Supports legacy software	Limited addressing space (related to next)
Support for older (legacy) hardware	Under-utilization of modern hardware's capabilities (EG: Memory / Disk)

14. What does GNU GPL license provide us? Guarantees that the software remains open ("copyleft").

Indemnifies (protects) developers from legal action and responsibility for implied warranties

Guarantees that no part of the software can be patented or claimed as intellectual property

15. An ODS must perform at least three functions - what are they? (ODS - On Disk System)

To tell where a file is located, to track the condition and availability of any free space, to define the schema by which the files are organized.

16. What is the purpose of the File Allocation Table? To describe the use of drive data "clusters" by file, though the use of a chart or map.

17. Explain the following entries:

Position	Value	Meaning
0	FD	Disk is double sided double Density
1	FFE	Cluster 1 is unused and not available
2	004	Next cluster of data resides on cluster 4 (remember, up to 256 clusters on a disk)
3	FF7	Cluster 3 is unused and flagged as "bad" (Contains broken / unreadable sector.)
4	005	Next cluster of the data resides on cluster 5
5	006	Next cluster of the data resides on cluster 6
6	FFF	This is the last cluster of data in the file
7	000	This cluster is unused and ready to accept another file's information

18. How many bytes are there in a DOS directory entry? 32 Bytes

19. How many characters are there reserved for file name and how many for the extension?

8.3 / "Eight and three" Eight name characters, three file-extension characters

20. List three attributes a file may have. Read-only, Archive, System, Directory, Volume Label

21. Can there be more than one directory on a FAT formatted file system? Yes (Trick question!)

The only true "directory" on a FAT filesystem is the root (main) directory. All other "directories" are just special file types that record the first cluster of the files that they "contain", much like the root directory.

22. Convert the following five hexadecimal numbers to decimal:

CF **207**
10 **16**
3D **61**
27 **39**
A5 **165**

23. Convert the following three decimal numbers to binary:

5 **0101**
20 **10100**
256 **1000000**

24. What is the significance of the following file extensions in a DOS and Windows system?

BAT **Denotes a "Batch file" - an executable script file to automate a series of commands and functions.**
EXE **An executable binary file - a binary "program"**
COM **A "compressed" text-based executable file based on old 8080 Digital Equipment (DEC) CP/M design**

25. What do the following commands do ?

cd **Change directory**
tree **Show the directory tree**
dir **list the contents of the current (or specified) directory.**

26. What is the equivalent DOS command to “tree” in Linux? **"tree"**

27. Why is it important to understand a hierarchical directory structure? **Hierarchical directory structures are used in most modern operating systems.**

28. What are the purposes of the files config.sys and autoexec.bat? **To load drivers and programs that will assist in the operation of DOS on the computer.**

29. What does the command sys C: do? **Copies the DOS operating system files to the ROOT of the destination drive.**

30. What is an appropriate DOS directory to put our new programs into? **Anywhere but the root directory**
Why? **On FAT16 systems (MS-DOS / FreeDOS) the root directory has a limit of 512 entries, so it is wise to use these records judiciously.**

31. What does the DOS “attrib” command do? **Changes the attributes of the file on which the command was run**

32. What command makes a new directory in DOS? **mkdir**

33. In what sector of the DOS disk would we expect the boot program? **Sector 0, 0, 0**