

Semester: Summer 2003

Instructor: Gerard Weatherby

60 points total.

The number of points follows each question. Write answers in the space provided; use the backs of pages if you need more space. **Be sure to indicate where the answer is** if you use the backs of pages. If you use an acronym in your answers, be sure to expand it upon first use. e.g. "The best graduate school is clearly RH (Rensselaer at Hartford)."

Answers given in italics are sample correct answers. In some instances alternat answers may be accepted.

1. (4) Briefly (one sentence) list the contributions of the following to open source software?

Richard Stallman

founded Free Software Foundation, wrote Gnu public license, started GNU project

Larry Wall

creator of Perl

Linus Torvalds

creator of Linux

Eric Raymond

Wrote Cathedral and Bazaar, started Open Source Initiative

2. (5) Opensource.org lists ten criteria open source software should have. List and briefly explain 5 of the 10 criteria.
5 of:

Free redistribution

Source code

Derived works

Integrity of author's source code

No discrimination against persons or groups

No discrimination against fields of endeavor

Distribution of license

License must no be specific to a product

The license must not restrict other software

The license must be technology- neutral

3. (6) Explain the difference between software which is *public domain*, licensed under the *GNU public license*, and licensed under the “MIT style license” used by Apache, PHP, X11, BSD Unix.

public domain - use is unrestricted

GNU public - can use and modify as desired, derivative works must be released under GNU license

MIT style license- can, use, modify and distribute. Derivative works may be restricted.

4. (4) What is the key thesis outlined in The Cathedral and the Bazaar? What is the "Cathedral" and what is the "Bazaar"?

That a free market of idea (The Bazaar) will outperform closed, proprietary software development (The Cathedral).

5. (3) What are limitations of open source software development?

Success is limited to things the developers care about.

Require a clear target for development.

Not all players are altruistic.

6. (1) What factors motivate open source developers?

Recognition among the community of developers, et. al.

7. (1) How can companies involved in open source make money?

Publishing books, documentation. Providing services.

8. (1) How does “Community” or “Shared” source differ from open source?

Distributor retains copyright and ownership. May not redistribute or create derivative works.

9. (2) In Perl, what does *use strict* do? What’s the advantage of using it?

Requires variables be declared before. Changes errors due to misspelling compile time errors instead of runtime (logic) errors.

10. (2) Write a regular expression to match **one or more** instances of “rh” appearing at the **beginning** of a string.

^(rh)+

11. (1) What is a Perl backreference?

Recording which part of a pattern matched a specified part of a regular expression

12. (1) How you include PHP commands in an HTML file?

<? ... >, <?php ... >, <script language=" php"> code</ script>, or <% code %>, <%= expression %>

13. (1) What organization develops and maintains PHP?

Apache Software Foundation

14. (1) What do the Perl and PHP *foreach* operators do?

Iterate over a collection

15. (1) How you get stack behavior in Perl or PHP?

Use functions `push`, `pop` or `array_push`, `array_pop`

16. (6) In the following chart, write a variable of the specified type in the specified language. Use the variable name “`opensrc`”.

| | <i>Perl</i> | <i>PHP</i> |
|---------------------------------|------------------------|------------------------|
| <i>scalar</i> | <code>\$opensrc</code> | <code>\$opensrc</code> |
| <i>indexed array</i> | <code>@opensrc</code> | <code>\$opensrc</code> |
| <i>associative array (hash)</i> | <code>%opensrc</code> | <code>\$opensrc</code> |

17. (4) List 4 relational database features supported by MySQL. Assume the most full featured table type, InnoDB, is used.

Four of:

Primary keys

Foreign keys

ACID transactions

Usual `create`, `select`, `insert`, `update`, `delete` commands

Users, passwords, grants

Typical database data types

18. (2) List 2 relational database features not supported by MySQL. Assume the most full featured table type, InnoDB, is used.

Two of:

Stored procedures

Triggers

View

Select ... into .. table

19. (3) Where did the name "Apache" originate? What lead to the starting of Apache? Who develops it?

Name comes from "A patchy" server

Several webmasters got together after the developer of HTTP daemon left NCSA

Apache Software Foundation

20. (2) What is Virtual Hosting? What's the advantage of Virtual Hosting?

Hosting multiple websites at same IP address.

Allows sites to be hosted at less cost by same webserver.

21. (4) What permissions are available on Linux files? How are they set?

read, write, execute

chmod instruction

22. (2) Explain the difference in the intended purpose of Linux and Minix.

Minix is academic (educational) system designed to be understood with one college semester.

Linux was intended as functional implementation of UNIX on 386 architectures.

23. (3) What considerations must be taken into account prior to installing Linux on a PC?

Whether the machine will be just Linux or dual boot.

Whether the same disk will be shared with other operating systems (e.g. Windows)

Whether Linux has dedicated drives/partitions available for its use.