

Solutions to Homework 4

Please note that some of the following solutions contain more information than you needed to provide to receive full credit. Others only provide examples, rather than an exhaustive list, of correct answers.

1. WEB SEARCHING AND GOOGLE (25 points)

A. One reason is that crawlers use up computational resources that might be needed by the web-page owner's organization. Another is that there might be web pages on the site that the owner wants to be seen only by members of his organization and that the site may have inadequate security; the easiest thing to do might be to deny crawlers access to anything on the site. Other plausible reasons will also be given full credit.

B. Yahoo!

C. A "hub" is a web page that contains good links, and an "authority" is one that contains good content. Hub-authority relationships are "mutually reinforcing" in that the higher the hub score (respectively, authority score) of a page, the more likely that the pages it points to (respectively, that point to it) have high authority scores (respectively, hub scores).

D. Caching

2. WEB SERVICES I (20 points)

The following example is illustrative of web services that "push" time-critical data onto users' cell phones, palm pilots, desktops, and other terminals so that they do not have to "pull" it off the web continuously in order to be sure that they can act when they have to.

Source of data: Online listings of apartments for rent

Value proposition to the customer: Using a notification-and-message "foundation" service, all listings that meet the user's requirements (e.g., location, price, number of rooms, building services) can be sent to his chosen terminal as soon as they are posted, potentially allowing him to beat the crowds.

Revenue model: Monthly, flat-rate subscription

3. WEB SERVICES II (30 points)

A. (iv) all of the above

B. Application layer

C. HTML was designed to format data for use by people, not programs. Programs can "scrape the screen" by downloading HTML source and parsing it, but this is inadequate for web services. The original structure and semantics of the data have, for the most part, been lost in the translation to HTML. If the web-accessible data are to be consumed by programs rather than by people, then they should be formatted in a semantically richer language than HTML.

Furthermore, data exchanged using HTML become interspersed with formatting commands that are useless to a program trying to obtain the raw data. A screen-scraping program that tries to isolate the data must distinguish the data from the commands, and any minor change in formatting style could affect the program's ability to locate the data within the HTML source.

D. XML

E. One potential advantage is "single sign-on." A user could have one (professionally maintained) profile containing a name, address, credit-card number, and other relevant information and use it for all of his online commercial transactions, rather than having to create one profile for each merchant (some of whom might be less able to maintain it securely than Microsoft is). Another potential advantage is that Microsoft could be held accountable for keeping these profiles safe and could be blamed publicly if they were compromised. The biggest potential disadvantage is the obvious one: Microsoft would have too much power over web-services architecture if it controlled this crucial layer and too much power over online commerce if it could broker all of the transaction data it would have access to.

4. XrML LICENSES (25 points)

A. license =

title = "XYZ software license"
issuer = "XYZ, Inc."
grant =
 principal = Bob
 right = install
 resource = software
 condition = one time only
grant =
 principal = Bob
 right = use
 resource = software
 condition = "valid not after" (purchase date + 30 days)
grant =
 principal = Bob
 right = use
 resource = software
 condition = fee paid
grant =
 principal = Bob
 right = view
 resource = tutorial files
 condition = none

B. license =

title = "Game Distribution License"
issuer = "Computer Game Manufacturer & Sons"
grant =
 principal = Distributor
 right = play
 resource = game
 condition = none

grant =
 principal = Distributor
 right = issue
 resource = grant =
 principal = anyone
 right = play
 resource = game
 condition = none
 condition = allConditions =
 condition = pay \$20 to manufacturer
 condition = “valid not after” August 1

grant =
 principal = Distributor
 right = issue
 resource = grant =
 principal = anyone
 right = play
 resource = game
 condition = none
 condition = allConditions =
 condition = pay \$15 to manufacturer
 condition = “valid not before” August 2

grant =
 principal = Distributor
 right = issue
 resource = grantGroup =
 principal = anyone
 grant =
 right = play
 resource = game
 condition = none
 grant =
 right = modify
 resource = game
 condition = none
 grant =
 right = print
 resource = maps
 condition = none
 condition = allConditions =
 condition = pay \$50 to manufacturer
 condition = “valid not after” August 1

grant =
 principal = Distributor
 right = issue
 resource = grantGroup =
 principal = anyone
 grant =
 right = play
 resource = game
 condition = none
 grant =

right = modify
resource = game
condition = none
grant =
right = print
resource = maps
condition = none
condition = allConditions =
condition = pay \$30 to manufacturer
condition = “valid not before” August 2

C. (i) **license** =

title = “Distributor-issued encyclopedia license”
issuer = Distributor
grantGroup =
principal = Alice
grant =
right = view
resource = encyclopedia
condition = none
grant =
right = issue
resource = **grant** =
principal = anyone
right = view
resource = encyclopedia
condition = “valid not after” 12/31/2003
condition = pay a \$5 fee to publisher

(ii) **license** =

title = “User-issued encyclopedia license”
issuer = Alice
grant =
principal = Bob
right = view
resource = encyclopedia
condition = “valid not after” 12/31/2003

- (iii) The license in part (i) can be obtained from the Distributor. The Distributor can issue these licenses without fulfilling any special conditions. The license in part (i) permits the license holder to view the encyclopedia freely, also without fulfilling any special conditions. In addition, the license in part (i) permits the holder to issue a more restricted license for encyclopedia viewing when the holder pays a fee to the publisher.

The license in part (ii) can be obtained from any part-(i) license holder, but it is more restricted. It can only be issued when the issuer pays a fee to the publisher, and it permits viewing the encyclopedia only until December 31, 2003.

A person who wants to view the encyclopedia can obtain a part-(i) or part-(ii) license, but the part-(ii) license forbids access after December 31, while the part-(i) license has no such restriction. (In both cases, the person will probably be charged for the license. However, note that the Distributor does not have a per-issue cost, but a part-(i) license holder does.)