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 = print
            resource = maps
            condition = none
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.

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