

# CS180 Database Management Systems - Winter 2003

## Homework Assignment 5

Due in class March 4, 2003  
(Late homeworks will not be accepted.)

**Instructions:** Answer all the questions concisely below. Points will be taken off for unnecessarily long answers. Please remember to include your name, student-id number, and email address in your homework submission.

1. You have been approached by the Wimbledon Tennis Association to help design a system that stores tennis match information in XML. Your first step is to capture the given requirements, described below, as accurately as possible in a DTD. (You may refer to the DTD tutorial from <http://www.w3schools.com/dtd/default.asp> for extra information.)

Every tournament in Wimbledon consists of two important types of matches: Men's singles and Women's singles.

Each match in men's singles must consist of a minimum of three sets. In Wimbledon men's singles, a player wins if he wins three sets of the match. Women's singles match must consist of a minimum of two sets. A women player wins a tennis match if she wins two sets of the match.

Needless to say, each match has two players and a match can be classified as a final, semi-final, or *n*th-round of the tournament.

For each player, the name, age, height, and optionally, her rank and career-prize money are recorded.

Write a DTD that will keep the above described information for Wimbledon.

2. Using the DTD you have provided in the previous question, display the following information in XML.

Men's Singles

4th Round:

Match between Leyton Hewitt and Younes El Aynaoui

Game	1	2	3	4
Lleyton Hewitt AUS	7	6	6	4
Younes El Aynaoui MAR	6	7	7	6

2nd Round:

Match between Andy Roddick and Adrian Panaitescu

Game	1	2	3
Andy Roddick USA	6	6	6
Adrian Voinea ROM	2	2	2

Leyton Hewitt (Australia):  
 Height: 1.8m  
 Singles Rank: 1  
 Career Prize money: USD 10.8M

Younes El Aynaoui (Morocco):  
 Height: 1.93m  
 Singles Rank: 15

Andy Roddick:  
 Height: 1.85m  
 Singles Rank: 9  
 Career Prize money: USD 1.9M

Adrian Voinea:  
 Height: 1.85M  
 Singles Rank: 36  
 Career Prize money: USD 1.7M

Women's Singles:

Game	1	2
Serena Williams USA	6	6
Tamarine Tanasugarn THA	1	1

Serena Williams:  
 Height: 1.78m  
 Singles Rank: 1  
 Career Prize Money: USD 10M

Tamarine Tanasugarn:  
 Height: 1.65m

Venus Williams:  
 Height: 1.85m  
 Singles Rank: 2  
 Career Prize Money: USD 11.9M

3. For this question, you can try running some XQueries on your own, though it is not required. You can find a version of XQuery engine in [tbelote/Quip](http://tbelote/Quip) on linux.ic or install a copy in your own machine from <http://developer.softwareag.com/tamino/quip/>. The database company.xml can be found on the link <http://www.soe.ucsc.edu/classes/cms180/Winter03/Homeworks/company.xml> from the class webpage. XQuery use cases are available from the link <http://www.w3.org/TR/xmlquery-use-cases/>.

The examples from XQuery use cases are useful but note that the syntax presented is slightly different from QuiP's XQuery syntax.

Consider the following XML document, called `company.xml`:

```
<db>
  <company name="IBM">
    <region country="India">
      <employee id="123">
        <name>Anand</name>
        <since>1978</since>
        <manager>877</manager>
        <department>Marketing</department>
      </employee>
      <employee id="893">
        <name><firstname>Asish</firstname><lastname>Gupta</lastname></name>
        <since>1990</since>
        <department>Marketing</department>
      </employee>
      <employee id="567">
        <since>1996</since>
        <name><firstname>Asish</firstname><lastname>Gupta</lastname></name>
        <department>Research</department>
        <manager>877</manager>
      </employee>
      <employee id="877">
        <since>1987</since>
        <name>Nappan</name>
        <department>Marketing</department>
      </employee>
    </region>
    <region country="USA">
      <employee id="355">
        <name>Anand</name>
        <since>1989</since>
        <manager>126</manager>
        <department>Research</department>
      </employee>
      <employee id="126">
        <name>Smith</name>
        <since>1995</since>
        <department>Research</department>
      </employee>
      <employee id="234">
        <name>Ginsberg</name>
        <manager>126</manager>
        <since>1995</since>
        <department>Engineering</department>
      </employee>
    </region>
  </company>
  <company name="MS">
    ...
```

</company>  
</db>

For each of the following problems, write an XQuery to compute the answer.

- Retrieve all employees of IBM.
- Retrieve all employees of IBM who joined earlier than 1990.
- Find the name of the manager of employee 234. (Please answer this question by doing a join.)
- Find for each department, all employees within that department for IBM India. That is, your result should list each department and within each department, list the employees that work in that department. (Refer to XQuery use case XMP:1.1.9.4 Q4 for an example.)