201300180 Data & Information – Test 1 (solutions)
4 May 2016, 13:45–15:15

Question 1 (Requirements) (30 points)

The two most important quality factors are
- *Functional correctness* (emergencies must not be missed)
  Example: 99.99% of the emergency situations must handled correctly;
- *Availability* (if the system is down, all the mobile monitored patients are potentially at risk)
  Example: System downtime shall not exceed 3 minutes on average and 10 minutes maximum.

Other quality factors that could be deemed very important, depending on your perspective are:
- *Time behaviour* (there should be no unnecessary delays, so that the nursing staff is notified immediately in case of an emergency)
- *Confidentiality*, Integrity (sensitive patient data should not be accessible to no-authorized persons)
- *User error protection* (the risk that an emergency is missed because a nurse would have set up a session incorrectly should be minimal)

Usability factors like *learnability, operability, accessability* are not on the top of the list in a situation, where all the staff who operate the system have been properly trained.

Other answers need not be wrong. They score higher or lower, depending on the motivation you give why this is important. Motivations that are specific for the case (e.g. "Interoperability is important, because the transceivers from an external party and the hospital's central system should collaborate flawlessly") score better than generic motivations that woud apply to any system (e.g. "Testibility is important so as to make sure that the system works well").

Question 2 (Web programming) (30 points)

a) A Servlet gets an HTTP request message through a doGet() or doPost() method, which has a parameter that represents the HTTP request message (HttpServletRequest). This class has methods that allow the contents of the HTTP request message to be inspected.

b) A Cookie and an HttpSession are defined to allow information about a client to be stored at the client side. A Cookie only allows string values to be stored, while an HttpSession allows objects to be stored. HttpSession can be implemented using Cookie.

c) View is often played by JSP, Control is often played by a Servlet and Model is often played by a JavaBean (Servlet is also acceptable). JSP is actually an HTML page and is suitable for presentation, Servlets are Java classes and are suitable for processing (reaction to input) and JavaBeans are suitable for representing data structures.

Question 3 (Database queries) (40 points)

a) Give an alphabetically ordered list of the names of all actors who acted together with George Clooney in one or more movies.

```
SELECT DISTINCT p2.name
FROM Movie m, Acts a1, Acts a2, Person p1, Person p2
WHERE p1.name = 'George Clooney'
  AND a1.pid = p1.pid
  AND m.mid = a1.mid
  AND a2.mid = m.mid
  AND p2.pid = a2.pid
  AND p1.pid <> p2.pid
ORDER by p2.name
```

b) For any movie that has been released in French, give the name of the movie and average runtime for all the countries in which the movie has been released. Only include movies with a minimal runtime of at least 100 (minutes).

```
SELECT m.name, AVG(r.runtime)
FROM Movie m, language l, runtime r
WHERE m.mid = l.mid
  AND r.mid = m.mid
  AND l.language = 'French'
GROUP BY m.name
HAVING MIN(r.runtime) >= 100
```

c) Give a list of movies that have been released in the Netherlands with certification 'AL' (allowed for all ages) but do not have not any certification (i.e., were not released) in Belgium.

```
SELECT m.name
FROM Movie m, Certification c1
WHERE m.mid = c1.mid
  AND c1.country = 'Netherlands'
  AND c1.certificate = 'AL'
  AND NOT EXISTS (
      SELECT *
      FROM Certification c2
      WHERE c2.mid = m.mid
        AND c2.country = 'Belgium' )
```