

CMSC 724, Spring 2015: Homework 1

Due Friday February 13, 2015, 11:59pm.

The homework is to be done by yourself. You are free to make reasonable assumptions about the problem if something is not fully specified – make sure to state any assumptions. Try to be concise in your answers – most answers should be a paragraph or two long. You can turn in a hard copy if you'd like before the deadline (slide under my office door if I am not there). Total weight = 5%.

1. Would you say the property graph model is similar to the network model? Why or why not? Does the property graph data model provide “physical independence” and/or “logical independence”?
2. Of the reasons that Abiteboul offers for using semi-structured data models (Section 2.2 of his paper), which one do you think is the most important today or moving forward? Briefly explain.
3. Explain the notion of “connection trap” for the schema: *Student(SID, name)*, *Professor(EID, name)*, *Course(CID, name)*, *TaughtStudent(EID, SID)*, *TookCourse(SID, CID)* (i.e., the schema contains a connection trap – explain). How should the schema have been designed to avoid the connection trap? (Make sure to read: <http://db.grussell.org/section005.html>)
4. List and discuss three reasons why databases need control over the buffer management.
5. Explain one scenario where it makes sense to assign multiple DBMS workers to a single SQL query, and discuss the pros and cons of doing so. There is a brief discussion towards the end of Section 2.3.