

### Assignment 3

CIS 452/552 Database Issues (Big Data), Winter 2017

**due 11:59 pm, Friday, February 17th**

1. A data warehouse for previous NCAA football games has five dimensions (date, game, location, player, and spectator), and two measures (count and charge). Charge is what a spectator pays when watching a game in a given date and location. Count is number of tickets sold. The spectators can be students, faculty, adults, seniors (older than 65), children (younger than 13), with each category having its own charge rate. The player information includes name, age, height, weight, position, the numbers of Receiving Yards, Rushing Yards, Interceptions, Fumbles, Tackles, Touch Downs, and Field Goals in a game.

(a) Draw a star schema for the data warehouse.

(b) If we treat spectators and players as persons who all have name, address, age. For example, players in one game can be spectators of another game. Please design a new schema to represent this. Use DMQL to define the new schema.

(c) Starting with the base cuboid [date, game, location, player, spectator], what specific OLAP operations (e.g., roll-up from quarter to year) should one perform in order to list the total charge paid by all students at Autzen Stadium in the fall of 2016 and Justin Herbert was one of players?

(d) Using a starnet query model to represent your design in (a) and the query in (c). Can you write down the query in (c) with SQL? If yes, show your SQL query. If not, explain why.

2. We talked about virtual data warehouse and data mediator in the class. Are they exactly the same thing? If not, what's the difference? Whether the virtual data warehouse can support the typical OLAP operations such as roll-up and drill-down?

3. Suppose that a data warehouse contains 20 dimensions, each with about five levels of granularity. Users are mainly interested in four particular dimensions, each having three frequently accessed levels for rolling up and drilling down. How would you design a data cube structure to support this preference efficiently?

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**To turn in by paper version:** Ask Cheri to put your answers to Prof. Dejing Dou's mailbox.

**To turn in by email:** Please email your answers to [dou@cs.uoregon.edu](mailto:dou@cs.uoregon.edu). We prefer that you send in a pdf file. If you are using Word, you should convert your word file to a pdf file.