

**Last NUID digit: 3, 5, 6, 7 or 8**

Please include your NUID and name in all submitted files.  
You can use any ERD design program of your choosing.  
Use AdventureWorks2008R2 for the SQL questions.

Question 1 (8 points)

Please design a relational database to help Wang Enterprise manage its field engineer operations based on the following business requirements.

- 1) Customers from many different locations call the call center to request field engineer support.
- 2) A support ticket based on one of the standard ticket templates is opened to track a request.
- 3) The ticket is assigned to a field engineer.
- 4) Management wants to know where a request originated so that field engineers can be best deployed.
- 5) There are five different work shifts. A field engineer works one of these shifts. The shift history for field engineers needs to be tracked.

Normalize the design to the 3rd normal form. Create the ERD in your design tool. Submit the ERD in pdf or as an image.

-- Question 2 (3.5 points)

/\* Write a query to retrieve the products which have been sold in all quarters of all years as reflected by the data stored in database. To be more specific, if there was any sale in a quarter, the product was sold in that quarter. The number of quarters must be calculated and cannot be hard coded.

Include the product id, number of quarters a product has been sold in, and total sales dollar amount of the product in the returned data. Use UnitPrice and OrderQty for calculating the product sales. format the total sales dollar amount as an integer.

Return only the products which have been sold to more than 2000 unique customers in this query.

Sort the returned data by the product id. Format the total sales as an integer. \*/

-- Question 3 (3.5 points)

/\* Write a query to retrieve the salesperson who was within the top 5 for selling products that were shipped to the number of unique states/provinces in desc and also within the top 5 for the total sales dollar amount in desc for each year. Exclude orders which don't have a salesperson specified for this query.

Use ShipToAddressID to determine what state/province a product was shipped to. The state/province is a part of an address. Use TotalDue for calculating the total sales dollar amount.

Return only the salesperson who have never had an order which had a totaldue amount < 10.

Include SalespersonID, Year, the number of unique states/provinces the salesperson's sold products were shipped to for the year, and the salesperson's total sales dollar amount for the same year. Format the sales amount as an integer. Sort the returned data by Year. \*/