

Final Exam - Management Information System

Part I - General Business Modeling (70 pts)

Background

Suppose you are a local manager of Best Western Hotels. Now you find that there may be a massive demand near the Rutgers University-New Brunswick campus.

The future demand includes: a music festival in Cook & Douglass campus, an business summit in RBS, an academic conference in The Heldrich Hotel (usually a conference need to appoint another hotel beside the main venue), the university tour of high school graduates, and the graduation ceremony.

Based on the current search, you find several hotels in the neighborhood.

(You can repeat the same search by [this link](#))



Question 1 (10 pts)

Form the Porter's Five Force Model to analyze the hotel market environment near the Rutgers University-New Brunswick.

Question 2 (10 pts)

If you choose the area near the Robert Wood Johnson University Hospital as your new hotel location, do SWOT analysis of this location.

Question 3 (10 pts)

Consider the location problem again, if we want to choose a location that can best fit all possible demands. Here, the best fit means, the sum of the linear distance from the hotel to each location in demands is as small as possible. Set the longitude and latitude of the hotel is x and y , the longitudes and latitudes of given locations are a_i and b_i , we can formulate the problem

$$\min \sum_i \sqrt{(x - a_i)^2 + (y - b_i)^2}$$

subject to $-180 \leq x \leq 180$
 $-90 \leq y \leq 90$

How to choose the location? Use optimization tool box to solve it.

Take screenshots of your solver dialog box, data cells, result, and the corresponding point in Google Map.

Question 4 (10 pts)

After picking the location, the construction starts. Meanwhile, you need to design the hotel management system for your new hotel. Please form the Business Process graph for the new hotel, and generate the business rules from the process.

(Hint: like the graph in slides Week 2-1, page 23)

Question 5 (20 pts)

Based on your business process and business rules, form the ER diagram for the system.

Question 6 (10 pts)

Given the sales data for 6 months, show the following charts with your comment and reasoning. (with graph title, legend, axes title, and appropriate styles)

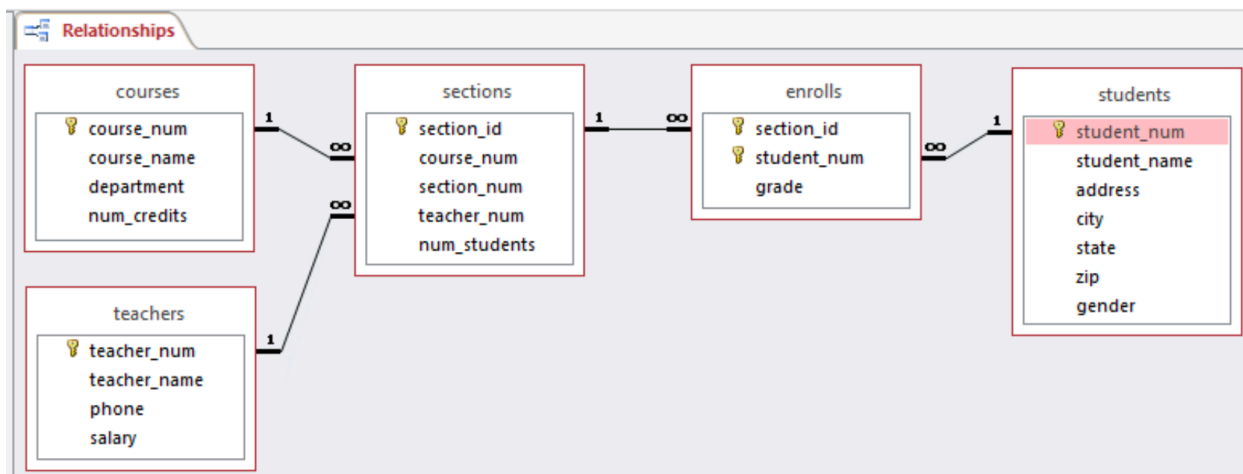
1. Calculate the Total Revenue by months, Total Revenue by categories, Expense and the Net Income based on the rate table
 2. The line chart (with the trend line) to show the trend of total revenue
 3. The line chart to show the trend of revenue of all categories
 4. The pie chart of total revenue to show the ratio of each revenue category.
 5. The stacked bar chart to show the information of Q6.2 and Q6.4
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Part II - Business Data Management (35 pts)

Question 7: Background

For the following questions, refer to the database in DISPLAYS AT END, which shows college enrollments for a single semester. The gender field in the Students table contains “M” for males and “F” for females, and the grade field in the Enrolls table contains a numerical grade, such as 4.0 for an “A”, 3.0 for a “B”, and so forth. Departments in the Courses table are identified by their names, which are unique.

Tables:



Question 7.1 (5 pts)

Assuming a fee of \$450 per credit, write a SQL query to calculate each student’s tuition. It should show each student’s student number, name, and total tuition for the semester.

Question 7.2 (5 pts)

Write a SQL query to find all students whose GPA’s are below 2. It should display the student number, name, and GPA for each such student.

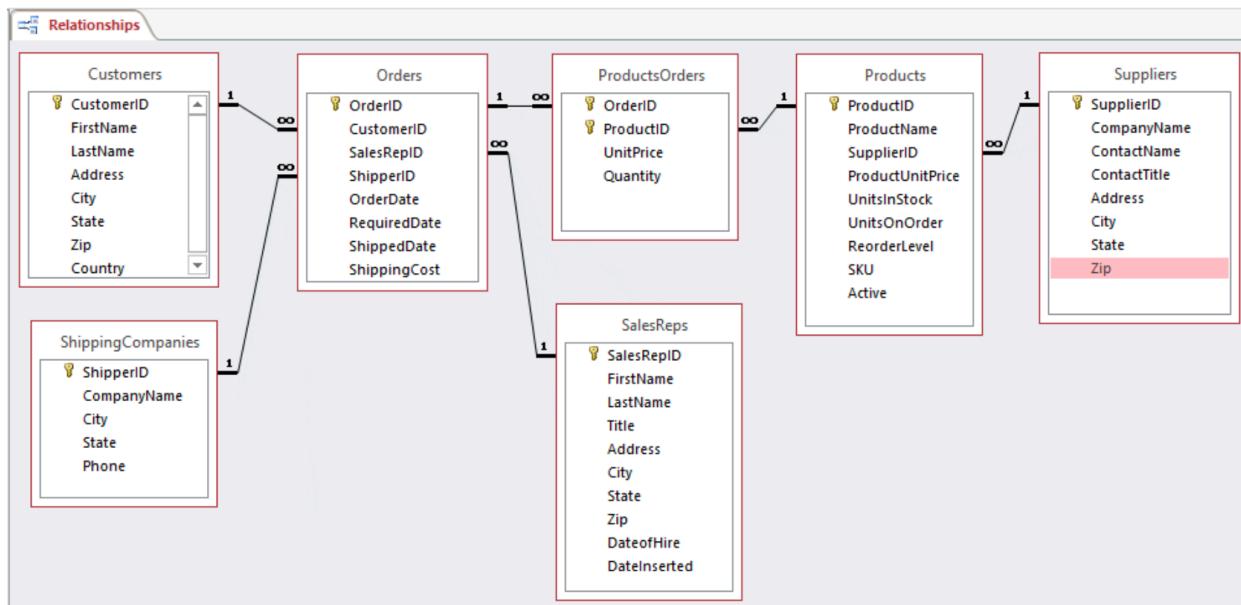
Question 7.3 (5 pts)

Write a SQL query to find the number of female enrollments in each department. The same woman signing up for two different courses in the same department counts as two separate enrollments. The query should show the name of each department and its number of female enrollments, and it should be sorted from largest to smallest number of enrollments, largest first.

Question 8: Background

In the following problems, refer to the Microsoft Access database depicted in BELOW. Note that the field UnitsOnOrder in the Products table is the product's total number of units on order from suppliers, whereas the Quantity field in ProductsOrders tables indicates the number of units of a product in a particular customer order. The ProductUnitPrice field in the Product table is the price charged to customers. The OrderDate field in the Orders table contains only a date, not a specific time of day.

Tables:



Question 8.1 (5 pts)

The operations group has requested report showing, for each product, the difference between the number of units in stock and the reorder level; in particular, negative values of this difference indicate products that need to be reordered. To satisfy their request, write a SQL query that shows the name of each product, the unit price, the number of units in stock, the reorder level, and the difference between the units in stock and reorder level (named "UnitStatus"). Sort the results alphabetically by product name.

Question 8.2 (5 pts)

The HR department is preparing for the "employee of the year" event, and has asked for a list of sales reps, showing each sales rep's total number of orders logged in 2013. Create a query that shows each sales rep's total number of orders for 2013 (named "TotalOrders"), the sale rep's ID, and their full name. Order the output by the total number of orders, largest first.

Question 8.3 (5 pts)

The accounting department would like to determine the value of inventory currently on order from suppliers, itemized by product. Create a query that shows the name of each product, its unit price, the number of units on order from suppliers, and the total dollar value of the units on order (called "ValueOnOrder"). Products which currently have zero units on order from suppliers should not appear in the query output. The value of each unit on order is considered to be the same as the corresponding ProductUnitPrice charged to customers.

Question 8.4 (5 pts)

In order to identify "slow moving" products, the marketing department would like report a showing all products that have accumulated \$1000 or less in total customer orders. Create a query that shows, for each such product, the product ID, the product name, and the total value of customer orders. Products which have never been ordered by customers do not have to appear in the query output.