National University of Computer & Emerging Sciences

Databases Systems (CS204)

Assignment # 1
Fall 2013

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You are required to submit this assignment in three phases. The due date is mention in front of each phase.

Phase No. 1 "ER Modeling"   **Date of Submission: October 10, 2013**
Phase No. 2 "Relational Model"   **Date of Submission: October 24, 2013**
Phase No. 3 "Schema Refinement"   **Date of Submission: November 14, 2013**
Note:

Phase No. 1 "ER Modeling"

ER model should be developed using any tool available for schema designing. There are few very good tools available at Netstorage

Phase No. 2 "Relational Model"

Relational model must be developed in any SQL sublanguage. The script should contain all integrity check, validation and testing code.

Phase No. 3 "Schema Refinement"

The schema refinement phase required you to go through your design again and apply normalization techniques and other optimization features. The submission will be a refine schema script.

Problem No. 1 WyFy

WyFy (Pvt.) Ltd. recently launches the wireless-based broadband internet access in Karachi, a city of more than 20 million people. They need to have a web-based CRM application which runs and improve their business.

Users

The web-application has sign-in form where they collect the information like CNIC, name, DOB, Gender, address in standard form, phone, cell, e-mail and connection type. Every new connection has to fill this form. On the other hand, customers who are interested in new connection can call a universal access number, the telephone operator get the required information from the caller and fill the same web-based form but this time an extra information is stored related to the fact that a telephone representative has created this profile. As soon the user requested the new connection, a sales force representative is assigned to act on this connection request. The sales person picks the requested device from the store and goes directly to the address of the new customer that has provided the request. The sales person installed and tests the device and connection and make sure that the customer signed a satisfactory delivery report. The sales person has to pick the connection charges as per the promotion. This amount he has to submit at the regional account department against a new connection request. Hence, a new connection is added for accounting. If the customer area in not within the coverage area, the installation may fail. In this case, the sales person has to update the system that there is no coverage for this customer. Depending on all such customer request the company may decide to extend their service area.

Usage History

Each time a user make a connection with the device, the application keep track of several things like: time of connection, IP assigned, bytes downloaded, bytes uploaded, and time of disconnection. Each user can view on the website, how many times he has connected, what is the available download limit, last five payments he has made against his connection. The usage history is used on several ways. In each promotion there is a connection bandwidth, download limit, cost of extra download per GB, monthly charges and a promotion acceptance charges. The company has rights to waive promotion charges. The company need to identify the user who has made the maximum downloads, has connected longest time with the WyFy, and the user who has not utilized there allowable download limits more than 50%.

Devices

The WyFy has bought three different kinds of devices.

Device	Charges	Security Deposit
Desktop Modem	1200	1000
WyFy Modem	1500	1500
Pocket Modem	1000	1500

Each device has Device #, Name, Manufacturer#, and Stock#. The WyFy generally buy these devices in bulk, hence they also has a price for each device. The useful life of each device is about 3 years.

Prepaid Packages

The prepaid packages offer hourly prepaid broadband service that is quite convenient and economical. The benefits of prepaid packages includes (i) No connection activation charges, (ii) No Bar on Volume (iii) No monthly billing and charges as low as Rs. 100 for usage. The package is available with bandwidth 512Kbps, 1Mbps , 1.5 Mbps and 2Mbps. The package also includes any of the three possible devices. The device security deposit is 2000, 2500, and 3000 for desktop modem, pocket modem and WiFi modem respectively. Users can recharge by using prepaid cards that are with following types. These types can be changed any time by the management.

Amounts	Hours	Validity
Rs. 100	5	7 days from first use.
Rs. 250	15	15 days from first use.
Rs. 500	32	30 days from first use.
Rs. 1000	65	35 days from first use.

Postpaid Packages

The postpaid packages serve for diverse internet requirements of the users. The postpaid packages include the following:

Package	Speed	Volume	Price
NetSurfer	512kpbs	15GB	900
Discovery	1Mbps	30GB	1550
Unlimited-One	1Mbps	No limits	1650
Unlimited-Two	2Mbps	No limits	2000
Student-Plus	1Mbps	25GB	1000

In postpaid packages, Rs.50 will be charged as service charges.

You are required to develop an ER model for the business of WyFy as per the assignment task.

Problem No. 2 Reflectors

Reflectors are in the business of providing a full range of Beauty-care Services. Besides providing traditional services like Mehndi, Makeup and Facial, they also provide specialized services like Rebounding, Streaking and Hair Treatment. It is the fastest growing beauty parlor in Pakistan. It is their extreme desire to provide the highest quality beauty-care services in the most pleasant environment with the best price. They have this vision, that they should be the first choice of their customer, and it means a sustained commitment to meet and exceed customer's expectations.

Customers

There are two different classes of customers (i) Guest and (ii) Members. There is a membership fees of Rs. 10,000/=, and the renewal fees of 2,500 per year. As a member you have certain benefits. There are discount prices for services and packages. There are also some free services through coupons and promotions, which runs throughout the year. A member can use his membership to take discount on his Guest, there are 5 guest per years on which a member can avail membership discount.

Services

They have a wide variety of services at their business centers. Each service has a name, and sub tasks related to this service, price and duration for the service. There are different prices for members. For example:

There are services like: Hair care and there are tasks Blow Dry, Rots Cutting, Trimming etc. each has a tariff price and membership price.

1. Hair Care

Blow Dry	1,000	750
Children's Cut	1,000	500
Dye (Natural)	1,500	800
Hair Cut	1,000	600
Hair Style	1,500	700
Ironing	1,500	1000
Roots (Natural)	1,500	800
Shampoo	400	250
Split End	1,200	500
Trimming (Simple)	1,000	250

Similarly, another service like Feet Care

Pedicure	800	450
Pedicure (Aromo) with Bleach	1,500	850
Pedicure (French) with Bleach	1,400	800
Pedicure with Paraffin	1,000	650

There are bunch of other services like: Bleach, Hand care, Hair fashion, Make up, Make over, Massage, Mehdi or Hena, Skin Care, Threading, and Waxing etc.

The design should be flexible enough to accommodate new services and tasks, which are being offered off- and on.

Packages

There are number of packages being offered, each package has a name, and description. A package has a number of different components like a Wedding Package, comprises of number of days being this service will be provided. Each day has certain services along with a description. For example, here is a description of a package:

Bridal-Package (5-days) – This package contains full bridal care for the 5-days of wedding.

FIRST DAY SERVICES	FOURTH DAY SERVICES
Cleansing and Bleach	Bridal Makeup of your choice
Aroma Manicure	Lashes / Nail Color, Flower & Full Setting
Aroma Pedicure	Beautiful Hairdo
Paraffin Wax	Juice / Tea / Coffee
Juice / Tea / Coffee	
	FIFTH DAY SERVICES / VALIMA DAY SERVICES
SECOND DAY SERVICES	Bridal Makeup of your choice with Beautiful
Waxing	Hairdo Juice / Tea / Coffee
Aroma Shining & Relaxing Massage	
Skin Analysis & Royal Skin Glowing Therapy	
Glamour Conditioning	
Juice / Tea / Coffee	
THIRD DAY SERVICES	
Deep Cleansing	
Fruit Shining Pack	
Uroosa Mehndi	
Juice / Tea / Coffee	

There are more than 30 packages currently running at Reflectors.

Staff

There are two different kinds of staff at Reflectors. One with a fixed salary, and other with charges per task. Depending on the assignments each staff has a task card, in which the manager has signed each task assigned and completed to the staff at the business center. Each card is than entered at the end of the day to the systems for each staff.

Cosmetics

The reflector need to record what is being purchased and from whom. There are no details for the purchase, only the order date; supplier, a small description of the items being ordered, and amount of the purchases are recorded.

Management

It is a proprietary business and the owner wants to have certain reports at each of the day, month and expenses at the Reflectors. One of the common reports is to have a daily cash registered amount at the end of the day.

The design should address all issues highlighted here is the business case.

Problem No. 3 Second-hand-Books.com.pk

A new website named ***second-hand-books.com.pk*** is about to launch in Pakistan. The website will provide a long standing wish of the poor students of this country to buy or sell their used books online. The company wishes to have a database schema for this website which must satisfy the rules and regulation of the business. In order to sell or buy a book from the website, the user must be a registered member of the website. The registration form requires some basic information about the user like: e-mail address, name, and address. The registration process is a two step process in which the first step is to get the users information via input in a form the second step is to confirm the processing via an e-mail indirection. After becoming a member, user can sell or buy books.

The selling process is of two types:

1. Regular sell: in this method the user place an ad for the book with some basic information about the book, like: title, authors, publisher, edition, binding type, number of pages, condition of the book, and the price of the book. The seller can also upload an image of the book. The buyer can buy these books at a price mentioned by the owner.

2. The second method of sell is via bidding from the interested buyer. The book is placed for sell and an initial bid price is given. The final date for the close of sell is published; the highest bidder of the book will get the book. The owner of the book has right to cancel all bidding.

The shipment of the book is via a private courier which gets the payment at the time of delivery of the book at the address of shipment. The cost of delivery also charged at a rate communicated by the courier. The payment of sell is received by the company and the payment to seller can be made via courier money order. The courier pays the cash to the seller as well. The buyer or seller can give comments on their transactions, after completing their transactional processes. Based on the comments, each user is assigned a ranking from the website; the ranking systems have 6 values, 1-6, where 6 being the highest value and retain a user as 6-star user.

The search processing must support multiple searching strategies like: searching on a specified filed, searching on a combination of fields, and on searching on the content and topics. The website initially allowing all these ads for free, but they have plans to charge some flat fee to every ad soon. The final schema must address all these requirements.