**BTD310- Assignment 1**

**Due date – October 1, 2017**

Please work in **groups** to complete this lab. This assignment is worth **6% of the total course grade** and will be evaluated through your written submission. Each day being late will result in 10% mark penalty. Also submitting individual work (as not being in the group) will result in 20% mark penalty.

Please submit the following files through Blackboard:

* Asg1.docx

1. Add this declaration on the top of your Asg1.docx file.

We, ------------ (mention your names), declare that the attached assignment is our own work in accordance with the Seneca Academic Policy. No part of this assignment has been copied manually or electronically from any other source (including web sites) **or distributed to other students.**

1. Specify what each member has done towards the completion of this work:

|  |  |  |
| --- | --- | --- |
|  | Name | Task(s) |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |

1. (25 marks) For each user view,
   1. Submit a 3NF solution. Show all steps: UNF, 1NF, 2NF, 3NF. Clearly show all dependencies.
   2. Show the dependency diagram at each normalized level.
2. Conceptual design:
   1. (15 marks) Show the ERD model for the (merged) conceptual design of the database.
   2. (10 marks) For each entity, clearly mark the primary and foreign keys as shown in the sample below:

**Relation1 [ column1 (PK), column2, column3, column4 (FK) ]**

**Description of Operations**

GTA Landscaping is a landscaping company that has been in business for over a decade.

GTA Landscaping's business is to offer several services to customers. Services include "Lawn Cutting", "Garden Planting", fall "Leaf Clearing", and winter "Snow Shoveling". Each customer may require one or more of these services at a time; and the customer may require the same service repeated several times each year.

Teams of employees deliver the services offered by GTA Landscaping. Each team can carry out all types of service, and more than one team can carry out each service. All of GTA Landscaping maintenance employees are organized into teams. Each employee can belong to only one team. Employee's OHIP (health card) number are also saved, in case an employee is injured on the job.

Finally, GTA Landscaping also sells lawn and garden products to customers. A customer can purchase one or more products. There are several of each product in stock to allow sales of the same product to any number of different customers. To help GTA Landscaping organize its products, each product is given a single classification. For example, GTA Landscaping sells the classification of "Garden Tools" which include products such as: "Garden Rakes", "Shovels", "Pics", "Axes", "Pitch Forks", and "Hand Shears". GTA Landscaping also sells a classification of "Shrubs" which include products: "Cedar", "Golden Cedar", "Mullberry", and "Juniper".

#### **GTA Landscaping: User View 1**

Two sample invoices are shown for the services sold. (An invoice is the same as a receipt). Once all services are completed for a customer visit, a customer invoice is written. This invoice will itemize many details including the services provided, the time it took to complete those services, the charge for those services, and the total of all service charges.

**Sample1**

**Invoice Statement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **INVOICE #:** | *1355* |  |  |  |
| **INVOICE DATE:** | *5-Jul-02* |  | **CUSTOMER:** | *56 - John Adams* |
| **WORK TEAM:** | *2* |  | **ADDRESS:** | *234 Bloor W* |
| **EQUIP. USED:** | *20 hp John Deer tractor/ mower* | | | *Toronto* |
|  | *10" tree pruning shears* | |  | *M2S 4S3* |
|  | *2 hp Johnson grass trimmer* | |  |  |
|  |  |  |  |  |
| **SERVICES:** |  |  |  |  |
| **SERVICE CODE** | **DESCRIPTION** | **HOURLY CHARGE** | **WORK DURATION (hours)** | **TOTAL CHARGE** |
| *LC* | *Lawn Cutting* | *$25.00* | *0.75* | *$18.75* |
| *LW* | *Lawn Weeding* | *$35.00* | *1.15* | *$40.25* |
| *LF* | *Lawn Fertilizing* | *$15.00* | *0.25* | *$3.75* |
| *TG* | *Tree Pruning* | *$45.00* | *0.50* | *$22.50* |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | **SUBTOTAL:** | *$85.25* |
|  |  |  | **GST (7%):** | *$5.97* |
|  |  |  | **PST (8%):** | *$6.82* |
|  |  |  | **TOTAL DUE:** | *$98.04* |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**Sample2**

**Invoice Statement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **INVOICE #:** | *1412* |  |  |  |
| **INVOICE DATE:** | *19-Jul-02* |  | **CUSTOMER:** | *34 - Ashley Riley* |
| **WORK TEAM:** | *3* |  | **ADDRESS:** | *156 Avindale Cresc* |
| **EQUIP. USED:** | *20 hp John Deer tractor/ mower* | | | *Toronto* |
|  | *2 hp Johnson grass trimmer* | |  | *M4T 4R7* |
|  | *Haggmann garden-tiller* |  |  |  |
| **SERVICES:** |  |  |  |  |
| **SERVICE CODE** | **DESCRIPTION** | **HOURLY CHARGE** | **WORK DURATION (hours)** | **TOTAL CHARGE** |
| *LC* | *Lawn Cutting* | *$25.00* | *0.75* | *$18.75* |
| *GW* | *Garden Weeding* | *$25.00* | *1.15* | *$28.75* |
| *GP* | *Garden Planting* | *$30.00* | *0.25* | *$7.50* |
| *GF* | *Garden Fertilizing* | *$10.00* | *0.50* | *$5.00* |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  | **SUBTOTAL:** | *$60.00* |
|  |  |  | **GST (7%):** | *$4.20* |
|  |  |  | **PST (8%):** | *$4.80* |
|  |  |  | **TOTAL DUE:** | *$69.00* |
|  |  |  |  |  |

#### **GTA Landscaping: User View 2**

Below is a list of GTA Landscaping teams of lawn care specialists that do the services for their customers. The Operations Manager uses this report to schedule which teams will be sent to which customers on any given workday. Team members work together when visiting a customer site.

**Team - Employee Reports**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TEAM** | **DESCRIPTION** |  |  |  |  |  |
| 1 | General Contracting | |  |  |  |  |
|  |  |  |  |  |  |  |
| **POSITION** | **NAME** | **EMP ID:** | **OHIP** | **HOME PHONE** | **START DATE** | **SKILLS** |
| Supervisor | Cindy Lee | 120 | 219032002 | 905-338-1234 | 1-Jan-98 | Electrical , |
|  |  |  |  |  |  | Plumbing , |
|  |  |  |  |  |  | General Contractor |
| Lawn Care | Amy Smith | 122 | 34111991 | 905-338-1234 | 30-Jun-99 | Irrigation , |
|  |  |  |  |  |  | Lawn Maintenance |
|  |  |  |  |  |  |  |
| **TEAM** | **DESCRIPTION** |  |  |  |  |  |
| 2 | Pruning and Planting | |  |  |  |  |
|  |  |  |  |  |  |  |
| **POSITION** | **NAME** | **EMP ID:** | **OHIP** | **HOME PHONE** | **START DATE** | **SKILLS** |
| Lawn Care | Paula Corelli | 121 | 325443001 | 416-458-4562 | 30-Jun-98 | Pruning , |
|  |  |  |  |  |  | Irrigation , |
|  |  |  |  |  |  | Fertilizing |
| Supervisor | Paul Huang | 123 | 54222991 | 416-932-4533 | 30-Jun-00 | "A" License , |
|  |  |  |  |  |  | Electrical , |
|  |  |  |  |  |  | General Contractor |
|  |  |  |  |  |  |  |
| **TEAM** | **DESCRIPTION** |  |  |  |  |  |
| 3 | General Maintenance | |  |  |  |  |
|  |  |  |  |  |  |  |
| **POSITION** | **NAME** | **EMP ID:** | **OHIP** | **HOME PHONE** | **START DATE** | **SKILLS** |
| Lawn Care | Maria Wong | 124 | 43524532 | 905-345-5366 | 23-Aug-98 | Pruning , |
|  |  |  |  |  |  | Lawn Maintenance |
| Supervisor | Phil Ramirez | 126 | 32543555 | 416-435-6599 | 3-Mar-01 | Irrigation , |
|  |  |  |  |  |  | Plumbing , |
|  |  |  |  |  |  | Electrical |

#### **GTA Landscaping: User View 3**

GTA Landscaping also sells products to its customers. Below is shown a sample product sales report list. This type of report is required by the Purchasing Manager to evaluate which products are selling well and which ones are not selling well. When placing new purchases to replace items already sold, the Purchasing Manager will analyse this report first. The list shows a sample of products purchased over a 3-day period.

**Product Sales Report - 3 day Sample**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PROD. CLASS:** | **PROD. ID:** | **PRODUCT:** | **CHARGE** | **QTY:** | **INVOICE ID:** | **INVOICE DATE:** | **SALES ASSISTANT:** | **CUST. NO.:** |
| *GT* | *10* | *6 foot garden rake* | *$12.00* | *1* | *1356* | *5-Jul-02* | *144 - Paul Smith* | *56* |
| *GT* | *40* | *Flat-nosed Shovel* | *$8.00* | *1* | *1356* | *5-Jul-02* | *144 - Paul Smith* | *56* |
| *FT* | *140* | *General grade lawn fertilizer* | *$10.00* | *3* | *1356* | *5-Jul-02* | *144 - Paul Smith* | *56* |
| *SB* | *100* | *Golden cedar sapling* | *$35.00* | *5* | *1367* | *6-Jul-02* | *145 - Maria Wong* | *7* |
| *SB* | *110* | *Mulberry sapling* | *$15.00* | *2* | *1367* | *6-Jul-02* | *145 - Maria Wong* | *7* |
| *GT* | *50* | *Garden pitch-fork* | *$7.00* | *1* | *1367* | *6-Jul-02* | *145 - Maria Wong* | *7* |
| *FT* | *140* | *General grade lawn fertilizer* | *$10.00* | *2* | *1367* | *6-Jul-02* | *145 - Maria Wong* | *7* |
| *SP* | *170* | *120 foot watering hose* | *$25.00* | *3* | *1401* | *6-Jul-02* | *144 - Paul Smith* | *34* |
| *SP* | *190* | *Rotating sprinkler jet* | *$19.00* | *3* | *1401* | *6-Jul-02* | *144 - Paul Smith* | *34* |
| *GT* | *50* | *Garden pitch-fork* | *$7.00* | *1* | *1405* | *7-Jul-02* | *145 - Maria Wong* | *56* |

#### **GTA Landscaping: User View 4**

Below is shown a sample product listing and pricing schedule. This report is used by the Sales Staff to determine pricing to be charged for the products that we sell. The "charge" of product sold is determined by adding the markup percentage (determined by class) to the cost.

**Product Report**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **PRODUCT CLASS:** | **CLASSIFICATION** | **PRODUCT ID:** | **DESCRIPTION** | **COST** | **MARKUP** | **CHARGE** |
| *GT* | *Garden Tools* | *10* | *6 foot garden rake* | *$9.23* | *30%* | *$12.00* |
| *GT* | *Garden Tools* | *20* | *7 foot leaf rake* | *$7.69* | *30%* | *$10.00* |
| *GT* | *Garden Tools* | *30* | *Round mouth shovel* | *$7.69* | *30%* | *$10.00* |
| *GT* | *Garden Tools* | *40* | *Flat-nosed Shovel* | *$6.15* | *30%* | *$8.00* |
| *GT* | *Garden Tools* | *50* | *Garden pitch-fork* | *$5.38* | *30%* | *$7.00* |
| *GT* | *Garden Tools* | *60* | *8 inch hand shears* | *$11.54* | *30%* | *$15.00* |
| *GT* | *Garden Tools* | *70* | *12 inch trimming shears* | *$14.62* | *30%* | *$19.00* |
| *GT* | *Garden Tools* | *80* | *10 inch tamper* | *$10.77* | *30%* | *$14.00* |
| *SB* | *Shrubs* | *90* | *Cedar sapling* | *$20.00* | *50%* | *$30.00* |
| *SB* | *Shrubs* | *100* | *Golden cedar sapling* | *$23.33* | *50%* | *$35.00* |
| *SB* | *Shrubs* | *110* | *Mulberry sapling* | *$10.00* | *50%* | *$15.00* |
| *SB* | *Shrubs* | *120* | *Juniper sapling* | *$16.67* | *50%* | *$25.00* |
| *FT* | *Fertilizers* | *130* | *Premium lawn fertilizer* | *$12.00* | *25%* | *$15.00* |
| *FT* | *Fertilizers* | *140* | *General grade lawn fertilizer* | *$8.00* | *25%* | *$10.00* |
| *FT* | *Fertilizers* | *150* | *Premium garden fertilizer* | *$14.40* | *25%* | *$18.00* |
| *FT* | *Fertilizers* | *160* | *General grade garden fertilizer* | *$9.60* | *25%* | *$12.00* |
| *SP* | *Sprinklers* | *170* | *120 foot watering hose* | *$17.86* | *40%* | *$25.00* |
| *SP* | *Sprinklers* | *180* | *12 inch aluminum sprinkler* | *$10.71* | *40%* | *$15.00* |
| *SP* | *Sprinklers* | *190* | *Rotating sprinkler jet* | *$13.57* | *40%* | *$19.00* |

#### **GTA Landscaping: User View 5**

GTA Landscaping maintains a list of supplier information and inventory information for the products being sold. All of our products are stored and displayed in one of the aisles of our main office showroom. (Inventory is the number of products GTA Landscaping has available for sale). Below is a sample Inventory Report

**Inventory Report**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **PRODUCT ID:** | **DESCRIPTION** | **INVENTORY** | **AISLE#** | **SUPPLIER** |
| *10* | *6 foot garden rake* | *5* | *1* | *Sheffield-Gander inc.* |
| *20* | *7 foot leaf rake* | *5* | *2* | *Sheffield-Gander inc.* |
| *30* | *Round mouth shovel* | *4* | *1* | *Husky Inc.* |
| *40* | *Flat-nosed Shovel* | *2* | *1* | *Husky Inc.* |
| *50* | *Garden pitch-fork* | *6* | *1* | *Husky Inc.* |
| *60* | *8 inch hand shears* | *9* | *2* | *Sheffield-Gander inc.* |
| *70* | *12 inch trimming shears* | *10* | *2* | *Sheffield-Gander inc.* |
| *80* | *10 inch tamper* | *3* | *2* | *Husky Inc.* |
| *90* | *Cedar sapling* | *34* | *5* | *Northwood Farms inc.* |
| *100* | *Golden cedar sapling* | *23* | *5* | *Northwood Farms inc.* |
| *110* | *Mulberry sapling* | *12* | *4* | *Sherwood Nursery* |
| *120* | *Juniper sapling* | *15* | *4* | *Northwood Farms inc.* |
| *130* | *Premium lawn fertilizer* | *4* | *6* | *Sherwood Nursery* |
| *140* | *General grade lawn fertilizer* | *12* | *6* | *Sherwood Nursery* |
| *150* | *Premium garden fertilizer* | *14* | *6* | *Sherwood Nursery* |
| *160* | *General grade garden fertilizer* | *12* | *6* | *Sherwood Nursery* |
| *170* | *120 foot watering hose* | *9* | *3* | *Diemar Garden Center* |
| *180* | *12 inch aluminum sprinkler* | *5* | *3* | *Diemar Garden Center* |
| *190* | *Rotating sprinkler jet* | *4* | *3* | *Diemar Garden Center* |