CSCI3170 Introduction to Database Systems

Tutorial 3 – Project Specification

An overview of the course project

GENERAL INFORMATION

Introduction

- **Sales System**
  - ❑ Command line interface (in **JAVA**)
  - ❑ Database Management System (**MySQL**)
- **Platform**
  - ❑ **CSE Linux machine**
    - With **JAVA JDK 7.0**
  - ❑ **MySQL Database**
    - For storing the data

Tutorials will be given on Linux, JAVA and MySQL

Accounts

- The following accounts will be provided

Account	Usage
CSE Unix account (For non-CSE students)	• Access the Linux machines • Connect to the CSE VPN
MySQL account (For each student)	• Connect to the database

Grouping

- **Grouping**
  - Each group should have **three** members
  - If you want to form a one-person group or a two-person-group, please send an email to tutor CUI Fan

    fcui22@cse.cuhk.edu.hk

  - You will be **randomly assigned** to a group if you are not in a group after the registration period

Milestones

Phase	Deadline	Tasks
Group Registration	21/10/2023	• Form a group
Phase 1	04/11/2023	• Draw an ER-diagram • Translate into a relation schema
Phase 2	2/12/2023	• Write a JAVA application • Write a read me file
DEMO	TBA	• Demonstrate your works

* The deadlines are subjected to change

Data Specification

- The data are in five categories
  - ❑ **Category**
  - ❑ **Manufacturer**
  - ❑ **Part**
  - ❑ **Salesperson**
  - ❑ **Transaction record**
- They are the format of the data files only
  - Not meant to be the tables in the final schema

Data Specification

- **Category**

Item Name	Format	Description
Category ID	Non-empty positive integer with exactly 1 digit.	A unique identifier for a category.
Category Name	Non-empty string with at most 20 characters.	The name of the category.

Data Specification

- **Manufacturer**

Item Name	Format	Description
Manufacturer ID	Non-empty positive integer with at most 2 digits.	A unique identifier for a manufacturer.
Manufacturer Name	Non-empty string with at most 20 characters.	The name of the manufacturer.
Manufacturer Address	Non-empty string with at most 50 characters.	The address of the manufacturer.
Manufacturer Phone Number	Non-empty positive integer with exactly 8 digits.	The phone of the manufacturer.

Data Specification

- **Part**

Item Name	Format	Description
Part ID	Non-empty positive integer with at most 3 digits.	A unique identifier for a part.
Part Name	Non-empty string with at most 20 characters.	The name of the part.
Part Price	Non-empty positive integer with at most 5 digits.	The price of the part.
Part Manufacturer ID	Non-empty positive integer with at most 2 digits.	The manufacturer ID of the part.
Part Category ID	Non-empty positive integer with exactly 1 digit.	The category ID of the part.
Part Warranty	Non-empty positive integer with exactly at most 2 digits.	The length of the warranty period of a product in terms of weeks.
Part Available Quantity	Non-empty non-negative integer with at most 2 digits.	The quantity of parts available.

Data Specification

- **Salesperson**

Item Name	Format	Description
Salesperson ID	Non-empty positive integer with at most 2 digits.	A unique identifier for a salesperson.
Salesperson Name	Non-empty string with at most 20 characters.	The name of the salesperson.
Salesperson Address	Non-empty string with at most 50 characters.	The address of the salesperson.
Salesperson Phone Number	Non-empty positive integer with exactly 8 digits.	The phone number of the salesperson.
Salesperson Experience	Non-empty positive integer with exactly 1 digits.	The experience of salesperson in terms of years

Data Specification

- **Transaction Record**

Item Name	Format	Description
Transaction ID	Non-empty positive integer with at most 4 digits.	The ID of the transaction record.
Part ID	Non-empty positive integer with at most 3 digits.	The ID of the part sold.
Salesperson ID	Non-empty positive integer with at most 2 digits.	The ID of the salesperson.
Transaction Date	Non-empty date in the format of DD/MM/YYYY.	The date of the transaction.

Assumptions and Regulations

- **System**
  - All numerical values are less than Java limit
  - The system is case sensitive.
  - Date format: [DD]/[MM]/[YYYY] (Y=year, M=month, D=day)
  - Time zone: Hong Kong (GMT+8)
  - No duplicate, empty row in any input and output.
  - Current date: System date of MySQL DBMS server.
  - Your Java program may assume that any value entered into any input field is correct in format only.
  - Your Java program may assume that any data file inputted into it is correct in format and content.

Assumptions and Regulations

- **Categories**
  - The ID and the name of the category are both unique.
  - All categories are identified by their ID.
- **Manufacturer**
  - The ID of the manufacturer is unique and all manufacturers are identified by their ID.
  - Some manufacturers may share the same name, phone number or address.

Assumptions and Regulations

- **Part**
  - The ID of a part is unique
  - All parts are identified by their ID.
  - Some parts may have the same name, price, warranty, available quantity, manufacturer ID or category ID.
- **Salesperson**
  - The ID of a salesperson is unique
  - All salespersons can be identified by their ID only.
  - Some salespersons may share the same name, phone number, address or years of experience.

Assumptions and Regulations

- **Transaction**
  - The ID of a transaction is unique and all transactions can be identified by their ID only.
  - Each transaction corresponds to the sale of one part.
  - Some salesperson may never sell any part and some parts may have never been sold.
  - A part can be sold only if it is still available (i.e. available quantity > 0).

Assumptions and Regulations

- **Transaction (Continue)**
  - A salesperson can sell the same part more than once by having more than one transaction.
  - There may be more than one transaction in one day.
  - After a salesperson sells a part, the system should reduce the available quantity of that part by one and add a transaction record accordingly.

ER-diagram and relation schema

PROJECT PHASE 1

Workflow

STEP 1: Read Sections 3 and 4 of the specification

STEP 2: Draw the ER-diagram accordingly

STEP 3: Transform into a relation schema

STEP 4: Remove any redundancy in the schema

Remarks

- Five input files **does not mean** that there are five entities in the ER-diagram
- You **may** need to add extra attributes or transform the existing attributes
- The relation schema should clearly show the **key relationships**
- The relation schema should **not consist of** redundant information

Requirements for the JAVA application

PROJECT PHASE 2: JAVA APPLICATION

Workflow

STEP 1: Read Section 5 of the specification

STEP 2: Write the JAVA application

STEP 3: Test with the provided data set

STEP 4: Test with other data sets

System Functions

- You have to implement three set of functions
  - **Functions for administrator**
  - **Functions for salesperson**
  - **Functions for manager**
- You need to implement all functions in a command line program

System Functions

- **Functions for administrator**
  - Create table schemas in the database
  - Delete table schemas in the database
  - Load data into the database
    - Your system should read data files from a user defined directory and insert data in those data files into the database
    - Please make sure that it can read the sample data provided
  - Show the information of the database
    - List the existing tables and the numbers of records

System Functions

- **Functions for salesperson**
  - Search for parts (only one method per query) by:
    - Part Name / Manufacturer Name (partial matching)
  - Sort parts by: (only one method per query) by price in:
    - Ascending order / Descending order
  - Output should include
    - **Part ID**
    - **Part Name**
    - **Manufacturer Name**
    - **Category Name**
    - **Available Quantity**
    - **Warranty Period**
    - **Part Price**

System Functions

- **Functions for salesperson**
  - Perform transaction (Selling a part) according to part ID and salesperson ID inputted
  - The program should check whether that part is available (*Part Available Quantity* > 0).
  - If the part is available, it is then sold and the database is updated accordingly.
  - If the part can be sold, an informative message on remaining available quantity of the part sold should be shown.
  - If the part cannot be sold, an error message should be shown.

System Functions

- **Functions for manager**
  - Count the number of transaction records of each salesperson within a given range on years of experience:
  - Output should include
    - **Salesperson ID**
    - **Salesperson Name**
    - **Years of Experience**
    - **Number of Transaction**
  - The transaction records should be sorted in descending order of Salesperson ID

System Functions

- **Functions for manager**
  - Sort and list the manufacturers in descending order of total sales value.
  - The program returns the results in terms of
    - **Manufacturer ID**
    - **Manufacturer Name**
    - **Total sales value**
  - The manufacturers should be sorted in descending order of total sales value

System Functions

- **Functions for manager**
  - Show the N most popular parts
  - The program return the N parts that are most often popular in terms of
    - **Part ID**
    - **Part Name**
    - **Total Number of Transaction**
  - The parts should be sorted in descending order of total number of transaction.

Demonstration

- All groups need to sign up for a demonstration on their phase 2 implementation. The registration page would be posted on the course website later.
- All group members should attend the demonstration.
- The duration for the demonstration for each group is about 20 minutes.
- The Java application will be tested in a Linux 64bit machine in the CSE department.
- The dataset used in the demonstration may be different from the dataset provided.

For Project Specification Queries
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