Database System Implementation

For CSC3170 Group Project

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1.Background Information

Project Settings

After thorough discussion, we decided to choose **option 1** with information including **branch 1 and 2**. For the extensive settings, we chose the **Sub-contraction-Share Constraint**, the **Geometrical Constraint**, **Complex Plant**, **Centralized Banking System**, and **Set-up Cost for Transportation**.

Abstract

Database Management Systems (DBMS) are widely used in various fields from keeping books ordered in the library to controlling all personal information on the internet. Within this project, we created a database and the DBMS for an organization providing a platform for online circuit manufacture orders.

Functionalities of our project

Purpose of the functionalities

The platform we build provide numerous functionalities for the client to utilize all of the potential of the database and database management system

Major functionalities of the implementation includes:

- Release of packages for the consumer
- Appoint certain plants for some package manually
- The assignment and start-time of some machines could be set under the constraints of plant appointments
- The processing record in end-time and expense of certain operations can be written back one it is finished
- The production information including the maximum capacity of some plants, or the demand changes of certain consumers within a period of time can be calculated

Implementation

The following information is a the relation schema and ER-diagram for was done in this project.

consumer((consumer_ID), location, package_ID, conBankAccount_ID, plant_ID)

orders(consumer_ID, package_ID, packageNum)

package((package_ID), timeRequired, Budget)

package_chips(package_ID, chip_ID, chipNum)

chip((chip_ID), chipType_ID, machine_ID)

chip_processed_plant(chip_ID, plant_ID)

plant((plant_ID), location, plantOwner_ID)

machine((machine_ID), machineType_ID)

chip_pre_operation((chipType_ID),(operation_ID), precedency)

operation((operation_ID), operationType_ID)

plant_holds_machine(plant_ID, machine_ID, machineNum)

machine_ability_operation(machine_ID, operation_ID, feasibility, time, machineExpense)

machine_process_operation(machine_ID, operation_ID)

planRecord((operation_ID), (machine_ID), planStartTime, planEndTime, processExpense)

actualRecord((operation_ID), (machine_ID), actStartTime, actEndTime, processExpense)

plantOwner((plantOwner_ID), plantBankAccount_ID, plan_ID)

Figure: Relation Schemas for this database

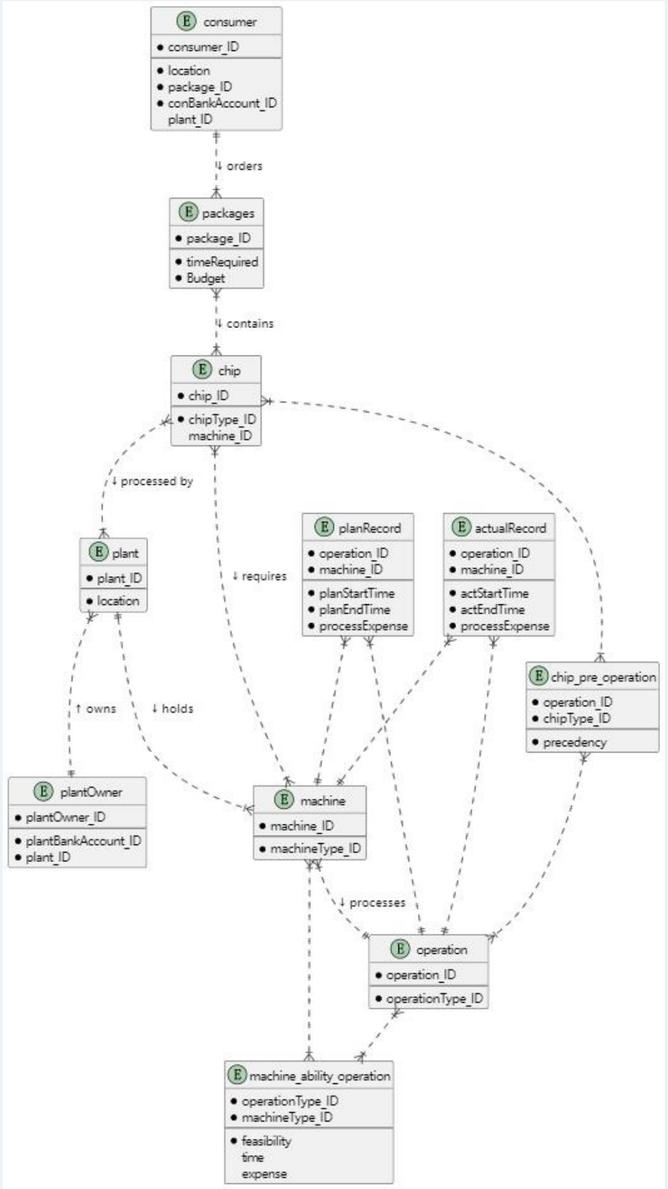

Figure: ER-Diagram for the database

Implementation

The following information is the database and queries we implemented in this project

```
-- ------------------------------------------------------------------------
-- The following content would be regarding the tables in this project
--
-- ** ALL FOREIGN KEY CONSTRAINT ARE REMOVED FOR SIMPLE ACCESS **
-- ------------------------------------------------------------------------

-- Consumer table
CREATE TABLE consumer(
    consumer_ID numeric(3, 0),
    consumerLocation varchar(40) not null, -- Changed the name to differentiate between plantLocation and consumerL
    package_ID numeric(3, 0) not null,
    conBankAccount_ID numeric(5, 0) not null,
    plant_ID varchar(20),
    primary key(consumer_ID)
);

-- Package table
CREATE TABLE package(
    package_ID numeric(3,0),
    timeRequired decimal(10, 0) not null, -- STORED IN SECONDS
    budget decimal(10, 0) not null,
    primary key(package_ID)
);

-- Chip table
CREATE TABLE chip(
    chip_ID varchar(7),
    chipType_ID char(2) not null,
    operation_ID varchar(20) not null,
    primary key(chip_ID, chipType_ID)
);

-- Plant table
CREATE TABLE plant(
```

Figure: MYSQL code for this database

```
SELECT phm.plant_ID
FROM plant_holds_machine phm
WHERE phm.plant_ID =
(
    SELECT p.plant_ID
    from plant p
    where (p.location != 'Longgang')
    OR
    (
        (p.location == 'Longgang') AND p.location =
            (
                SELECT c.location
                from consumer c
                where c.consumer_ID = _consumer
            )
    )
    AND
    phm.machine_ID =
    (
        SELECT mao.machine_ID
        FROM machine_ability_operation mao
        WHERE mao.operation_ID =
        (
            SELECT c.operation_ID
            from chip c
            where c.chip_ID =
            (
                SELECT pc.chip_ID
                from package_chips pc
                where pc.package_ID = _package
            )limit _process,1;
        )
    )
```

Figure: Query for the database

Implementation

The following information is part of the HTML code:

```
<body>
  <div class="login-wrap">
    <div class="loginBox">
      <ul id="L-ul">
        <li class="login1-li">
          <p class="L-big">注册</p>
          <div class="L-short L-long"></div>
        </li>
        <li class="login1-li">
          <p class="LoginTitle">密码登录</p>
          <div class="L-short login-L"></div>
        </li>
      </ul>
      <div class="L-content" style="display: block;">
        <div class="account-tabcon-start">
          <div class="account-form">
            <div class="account-form-error"><span class="hide"></span></div>

            <div class="account-form-raw">
              <label class="account-form-label">手机号:</label>
              <div class="account-form-field account-form-field-phone">
                <input type="phone" name="phone" maxlength="13"  autocomplete="off" class="account-form-input admi
                <div class="account-form-field-area-code">
                  <div class="account-form-field-area-code-label js-choose-district">+86</div>
                </div>
              </div>
            </div>
            <div class="account-form-raw">
              <label class="account-form-label">密码:</label>
              <div class="account-form-field account-form-codes">
                <input id="code" type="text" name="code" maxlength="6" class="account-form-input psw"
                  placeholder="设置密码" tabindex="2" autocomplete="off" style="padding-left: 10px;">
                <div class="account-form-field-code">
                </div>
              </div>
            </div>
            <div class="account-form-raw">
              <label class="account-form-label">确认密码:</label>
```

Figure: HTML code for demonstration

DEMONSTRATION Phase