University of British Columbia

Department of Computer Science

CPSC 304 2019 W2

Group Project - Implementation of a Relational Database

Project Title:	Hydroponic gardening
Project Milestone:	IV

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above.In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

Hydroponic Garden Management System

Summary

The hydroponic garden management system has two main sections. The first one allows for staffing and inventory management. The system allows for the scheduling and task assignment of the various employees (gardeners and/or maintenance). In addition, the system keeps track of the inventory of the garden, tracking information about the amount of plants currently have, the chemical needed for the plants, seeds stock, plant lighting and watering. It allows the manager the quickly identify needed supplies and order them from the suppliers. The second section of our system is focused on recording specific information about the various plants in the garden. It allows staff to input information for each specific plant that helps track best practices in terms of plant care, such as water temperature and nutrient profile. Further attributes include essential minerals and light requirements. The system also has search functionality, allowing staff to quickly find any plants available in the garden, as well as advanced search that can help locate specific information on individual plants. Further, there are options allowing for the calculation of average growth rate of two or more plants with a specific nutrient of interest.

Schema Changes

#	Original schema	Final schema	List of Changes
1	PlantHas (P_ID**:** INT, **Invetory_ID**: INT, P_ScientificName: CHAR (40), P_Description: CHAR (60), P_CommonName: CHAR (20), Amount: INT)	PlantHas (P_ID**:** INT, P_ScientificName: CHAR (100), P_Description: CHAR (200), P_CommonName: CHAR (100), Amount: INT) • UNIQUE (P_ScientificName, P_CommonName)	- Inventory foreing key was deleted from plants because it is easier to access all inventory items from the nutrients table - Added unique constraint to avoid duplicate plants - Increased string size for char()
2	Lighting (Light_Serial#: INT, Wavelength: INT, Bulb_TYPE: CHAR (10))	Lighting (Light_SerialNo: INT, Wavelength: INT, Bulb_TYPE: CHAR (40))	- Increased string size for char() - PK name was changed because # produces errors
3	GrowthRate (StartDate: DATE, EndDate: DATE, **P_ID:** INT, LengthGrowth: REAL)	GrowthRate (StartDate: DATE, EndDate: DATE, **PG_ID:** INT, LengthGrowth: REAL)	- P_ID changed to PG_ID to avoid errors like “P_ID is ambiguous”
4	Nutrients (N_ID**:** INT, N_Name: CHAR (20), N_hazards: CHAR (50), N_Description: CHAR (30))	Nutrients (N_ID**:** INT, **IN_ID:** INT, N_Name: CHAR (60), N_hazards: CHAR (200), N_Description: CHAR (200))	- Inventory foreign key was added because it was easier to access inventory items
5	Need (**P_ID:** INT**, Light_Serial#:** INT)	Need (**PN_ID:** INT**, Light_SerialNo:** INT)	- PK names were updated as changes were made on the main tables - Increased string size for char()

6	Requires (**N_ID:** INT, **P_ID:** INT)	Requires (**NR_ID:** INT, **PR_ID:** INT)	- P_ID changed to PR_ID to avoid errors like “P_ID is ambiguous” - N_ID changed to NR_ID to avoid errors like “NR_ID is ambiguous”
7	EssentialMinerals (**N_ID:** INT**,** EM_Type: CHAR (20), EM_Concentration: REAL)	EssentialMinerals (**NM_ID:** INT**,** EM_Type: CHAR (20), EM_Concentration: REAL)	N_ID changed to NM_ID to avoid errors like “NM_ID is ambiguous”
8	Water (**N_ID:** INT**,** Temperature**:** REAL, Ph: REAL)	Water (**NW_ID:** INT**,** Temperature**:** REAL, Ph: REAL)	N_ID changed to NW_ID to avoid errors like “NW_ID is ambiguous”
9	Has (**Task#**: INTEGER, **Year**: INTEGER, **Month**: INTEGER, **Day**: INTEGER)	Has (**TaskNum**: INTEGER, **Schedule_Num** INTEGER)	Task# name was changed because # produces errors, and changed PK,FK For schedule as otherwise we would not satisfy a unique PK for schedule if we wanted to schedule two tasks on the same day
10	Task (Task#: INTEGER, Task_Type: CHAR (50), T_notes: CHAR (60))	Task (TaskNum: INTEGER, Task_Type: CHAR (50), Task_Name CHAR(30), T_notes: CHAR (60))	Task# name was changed because # produces errors, added task name to improve ui experience (display, inserting)
11	Schedule (Year: INT, Month: INT, Day: INT, Start_Time: INT, End_Time: INT, **E_SIN:** INT)	Schedule (Schedule_Num INT, Scheduled_Date DATE, Start_Time: INT, End_Time: INT, **E_SIN:** INT)	Added scheduled num as PK to avoid having duplicate dates as PK if we wanted to schedule more than one task on the same day, added

			schedule_date as a field to hold the date
12	Employee (E_SIN: INT, E_Name: CHAR(20), E_phone#: CHAR(10), E_adress: CHAR(20), **Year**: INT, **Month**: INT, **Day**: INT)	Employee (E_SIN: INT, E_fname CHAR(20), E_lname CHAR(50), E_phone#: CHAR(10), E_address: CHAR(20), E_Type CHAR(20)	Removed year, month, int as no need for the day in employee. Added first and last name attributes, and added an employee type (facility, operations, gardener) to help with searching
13	Supplier(Supplier_ID INT, Supplier_email CHAR(20) NOT NULL, FOREIGN KEY (Supplier_email) REFERENCES SupplierInfo(Supplier_email));	Supplier(Supplier_ID INT, S_fname CHAR(50), s_lname CHAR(50), S_phone CHAR(20), Supplier_email CHAR(20));	Removed foreign key to supplier_info table as it seemed like a waste of space in the database to create a table just to hold the name and phone of an employee. Also made querying easier as less redundant joins
14	SupplierInfo(Supplier_email Supplier_Name CHAR(20) PRIMARY KEY, CHAR(20), S_Phone# CHAR(10));	removed	Explanation above
15	Provides (**Inventory_ID**: INT, **Supplier_ID**: INT)	Provides (**Inventory_ID**: INT, **Supplier_ID**: INT)	No changes