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COMP 421

Database Systems

Delivery Restaurant Management System and Database

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1. Trigger

We created a trigger to delete the orders that have been delivered. A check is done on Fulfills table to check for a delivered 'OID' and then delete the corresponding OID from Orders and so on.

```
CREATE TRIGGER fulfilled
AFTER UPDATE On Fulfills
FOR EACH ROW
DELETE FROM Order
WHERE oid IN (SELECT oid
              FROM Fulfills
              WHERE delivered='Y')
```

- Modification that fires the trigger:
UPDATE Fulfills SET delivered='Y' WHERE oid=1

```
db2 => SELECT * FROM Fulfills
```

SID	OID	DELIVERED
6	2	N
1	3	N
3	4	N
4	5	N
6	6	N
1	7	N

6 record(s) selected.

```
db2 => SELECT * FROM Order
```

OID	METHOD
2	phone
3	online
4	online
5	phone
6	phone
7	phone

6 record(s) selected.

Order with OID 1 has been deleted from Order and Fulfills Table.

- Modification that does not fire the trigger:

```
UPDATE Fulfills SET delivered='N' WHERE oid=1
```

```
db2 => SELECT * FROM Fulfills
```

SID	OID	DELIVERED
	6	1 N
	6	2 N
	1	3 N
	3	4 N
	4	5 N
	6	6 N
	1	7 N

7 record(s) selected.

```
db2 => SELECT * FROM Order
```

OID	METHOD
1	online
2	phone
3	online
4	online
5	phone
6	phone
7	phone

7 record(s) selected.

Order with OID 1 is still in Fulfills and Order table.

2. Stored Procedure

The stored procedure computes the salary of an employer with a specific raise percentage.

```
CREATE PROCEDURE CALC_SALARY(INOUT SID_IN INT,  
    IN RAISE_PERCENT DECIMAL(2,2),  
    OUT EMPLOYEE_FIRSTNAME VARCHAR(30),  
    OUT EMPLOYEE_LASTNAME VARCHAR(30),  
    OUT SALARY_RESULT INT)  
LANGUAGE SQL  
BEGIN  
    DECLARE CURRENT_SALARY INT DEFAULT 0;  
    SELECT FIRSTNAME, LASTNAME, SALARY INTO EMPLOYEE_FIRSTNAME, EMPLOYEE_LASTNAME,  
CURRENT_SALARY FROM STAFF  
    WHERE SID=SID_IN;  
    SET SALARY_RESULT = CURRENT_SALARY * RAISE_PERCENT + CURRENT_SALARY;  
END@
```

```
db2 => call CALC_SALARY(9, .5, ?, ?, ?)@
```

Value of output parameters

Parameter Name : SID_IN

Parameter Value : 9

Parameter Name : EMPLOYEE_FIRSTNAME

Parameter Value : Eric

Parameter Name : EMPLOYEE_LASTNAME

Parameter Value : Long

Parameter Name : SALARY_RESULT

Parameter Value : 4140

Return Status = 0

```
db2 => SELECT * FROM STAFF@
```

SID	PHONE	SALARY	FIRSTNAME	LASTNAME
1	438-046-1796	3030	Jerry	Sanchez
2	514-792-8340	3390	Susan	Perez
3	514-590-2898	3190	Chris	Flores
4	514-317-7526	2890	Joe	Kelly
5	438-637-4331	2370	Jacqueline	Carter
6	514-743-7636	3370	Walter	Hill
7	514-134-9922	2100	Virginia	Mitchell
8	438-294-1394	2210	Louise	Thompson
9	514-331-7527	2760	Eric	Long
10	438-610-3574	2500	Paul	Peterson
11	438-542-6958	3040	Martin	Rodriguez
12	438-221-7809	2750	Brandon	Gonzalez

```
12 record(s) selected.
```

2760 with a raise of 50% -> $2760 \times 1.5 = 4140$

3. User Friendly Application Program

Alternative options we offer to the user:

1. Add a new customer. Ask the user for first name, last name, phone number, and address.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new employee.
- 3) Add a new menu item.
- 4) For Order - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: **1**

Enter first name:

Sandra

Enter last name:

Edwards

Enter address:

3432 Milton street

Enter phone number in following format 000-000-0000:

514-574-4302

New Customer Added.

```
-bash-3.2$ db2 "SELECT * FROM Customers"
```

CID	FIRSTNAME	LASTNAME	ADDRESS	PHONE
1	Emanuel	Moody	123 Front street	514-212-6366
2	Vanessa	Hampton	12 Grand street	438-783-2583
3	Rose	Rhodes	1232 Parc street	514-271-0615
4	Tina	Morris	989 Juliette street	514-439-1412
5	Louise	Nelson	223 Cordner street	438-253-6201
6	Sandra	Edwards	3432 Milton street	514-574-4302

6 record(s) selected.

2. Add a new staff. Ask the user for first name, last name, phone number, salary information, and position information (cook, waitress/waiter, delivery). Using position information it either adds the staff into GeneralStaff or DeliveryStaff.
 - a. Adding DeliveryStaff.

Screenshot of terminal:

Options:

- 1) Add a new customer.

- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Customer - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: **2**

Enter first name:

Martin

Enter last name:

Rodriguez

Enter phone number in following format 000-000-0000:

438-542-6958

Enter position (waiter/waitress, cook, delivery etc.):

delivery

Enter monthly salary:

3040

New Staff Added into Staff and DeliveryStaff.

-bash-3.2\$ db2 "SELECT * FROM Staff"

SID	PHONE	SALARY	FIRSTNAME	LASTNAME
1	438-046-1796	3030	Jerry	Sanchez
2	514-792-8340	3390	Susan	Perez
3	514-590-2898	3190	Chris	Flores
4	514-317-7526	2890	Joe	Kelly
5	438-637-4331	2370	Jacqueline	Carter
6	514-743-7636	3370	Walter	Hill
7	514-134-9922	2100	Virginia	Mitchell
8	438-294-1394	2210	Louise	Thompson
9	514-331-7527	2760	Eric	Long
10	438-610-3574	2500	Paul	Peterson
11	438-542-6958	3040	Martin	Rodriguez

11 record(s) selected.

-bash-3.2\$ db2 "SELECT * FROM DeliveryStaff"

SID

 1
 3
 4
 6
 9
11

6 record(s) selected.

b. Adding GeneralStaff.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Customer - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: **2**

Enter first name:

Brandon

Enter last name:

Gonzalez

Enter phone number in following format 000-000-0000:

438-221-7809

Enter position (waiter/waitress, cook, delivery etc.):

cook

Enter monthly salary:

2750

New Staff Added into Staff and GeneralStaff.

```
-bash-3.2$ db2 "SELECT * FROM Staff"
```

SID	PHONE	SALARY	FIRSTNAME	LASTNAME
1	438-046-1796	3030	Jerry	Sanchez
2	514-792-8340	3390	Susan	Perez
3	514-590-2898	3190	Chris	Flores
4	514-317-7526	2890	Joe	Kelly
5	438-637-4331	2370	Jacqueline	Carter
6	514-743-7636	3370	Walter	Hill
7	514-134-9922	2100	Virginia	Mitchell
8	438-294-1394	2210	Louise	Thompson
9	514-331-7527	2760	Eric	Long
10	438-610-3574	2500	Paul	Peterson
11	438-542-6958	3040	Martin	Rodriguez
12	438-221-7809	2750	Brandon	Gonzalez

12 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM GeneralStaff"
```

SID	POSITION
2	Manager
5	Cook
7	Waitress
8	Waitress
10	Cook

12 cook

6 record(s) selected.

3. Add a new menu. Ask the user for name, description, price, whether it is beverage or food, and category. If it is food it also gets added to Food, and if it is beverage it also gets added to Beverage.
 - a. Adding Food.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Customer - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: 3

Enter name:

Meat Lovers

Write description:

Pepperoni, mozzarella, ground beef, bacon

Enter type (Food or Beverage):

Food

Enter category:

Pizza

Enter price:

14.99

New Menu Added into Menu and Food.

-bash-3.2\$ db2 "SELECT * FROM Menu"

MID	NAME	DESCRIPTION	PRICE
1	Cheese	Tomato sauce, mozzarella	11.99
2	All Dressed	Pepperoni, mushrooms, green peppers, mozzarella	12.99
3	Pepperoni	Pepperoni, mozzarella	12.99
4	Bacon	Mozzarella, bacon, mushrooms	12.99
5	Smoked Meat	Mozzarella, smoked meat	12.99
6	Mexican Beef	Onions, hot peppers, beef, mozzarella	12.99
7	Vegetarian	Mushrooms, onions, green peppers, mozzarella	12.99
8	Hawaiian	Ham, pineapple, mozzarella	12.99
9	Philly	Mushrooms, steak, onions, peppers, mozzarella	13.99
10	Soft Drinks 355ml	-	1.25
11	Soft Drinks 2L	-	2.99
12	Garden Salad	-	3.99
13	Cheese Bread	-	4.99
14	Fries Small	-	1.49
15	Fries Large	-	1.99

16 Chicken Wings 10pcs	-	7.99
17 Chicken Wings 20pcs	-	13.99
18 Meat Lovers	Pepperoni, mozzarella, ground beef, bacon	14.99

18 record(s) selected.

-bash-3.2\$ db2 "SELECT * FROM Food"

MID	CATEGORY
1	Pizza
2	Pizza
3	Pizza
4	Pizza
5	Pizza
6	Pizza
7	Pizza
8	Pizza
9	Pizza
12	Sides
13	Sides
14	Sides
15	Sides
16	Sides
17	Sides
18	Pizza

16 record(s) selected.

b. Adding Beverage.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Customer - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: 3

Enter name:

Orange Juice

Write description:

Enter type (Food or Beverage):

Beverage

Enter category:

Juice

Enter price:

1.89

New Menu Added into Menu and Beverage.

```
-bash-3.2$ db2 "SELECT * FROM Menu"
```

MID	NAME	DESCRIPTION	PRICE
	1 Cheese	Tomato sauce, mozzarella	11.99
	2 All Dressed	Pepperoni, mushrooms, green peppers, mozzarella	12.99
	3 Pepperoni	Pepperoni, mozzarella	12.99
	4 Bacon	Mozzarella, bacon, mushrooms	12.99
	5 Smoked Meat	Mozzarella, smoked meat	12.99
	6 Mexican Beef	Onions, hot peppers, beef, mozzarella	12.99
	7 Vegetarian	Mushrooms, onions, green peppers, mozzarella	12.99
	8 Hawaiian	Ham, pineapple, mozzarella	12.99
	9 Philly	Mushrooms, steak, onions, peppers, mozzarella	13.99
	10 Soft Drinks 355ml	-	1.25
	11 Soft Drinks 2L	-	2.99
	12 Garden Salad	-	3.99
	13 Cheese Bread	-	4.99
	14 Fries Small	-	1.49
	15 Fries Large	-	1.99
	16 Chicken Wings 10pcs	-	7.99
	17 Chicken Wings 20pcs	-	13.99
	18 Meat Lovers	Pepperoni, mozzarella, ground beef, bacon	14.99
	19 Orange Juice		1.89

19 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Beverage"
```

MID	CATEGORY
	10 Non-alcohol
	11 Non-alcohol
	19 Juice

3 record(s) selected.

4. Customer checks whether their most recent order has been delivered or not by entering their first name, last name, and phone number.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Order - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: 4

Enter customer's first name:

Rose

Enter customer's last name:

Rhodes

Enter customer's phone number in the following format 000-000-0000:

514-271-0615

The order ID: 7, ordered by Rose Rhodes has not been delivered yet.

```
-bash-3.2$ db2 "SELECT * FROM Customers WHERE firstname='Rose' AND lastname='Rhodes' AND phone='514-271-0615'"
```

CID	FIRSTNAME	LASTNAME	ADDRESS	PHONE
3	Rose	Rhodes	1232 Parc street	514-271-0615

1 record(s) selected.

```
-bash-3.2$ db2 "SELECT MAX(oid) FROM Done_by WHERE cid=3"
```

1

7

1 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Fulfills WHERE oid=7"
```

SID	OID	DELIVERED
1	7	N

1 record(s) selected.

5. Customer moves to a new place. Customer enters their name, phone number, and new address, and their original account information and value in *Lives_in* table gets updated.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Order - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: 5

Enter customer's first name:

Emanuel

Enter customer's last name:

Moody

Enter customer's phone number in the following format 000-000-0000:

514-212-6366

Enter new address:

782 Sherbrooke street

Enter new postal code:

H3A1G1

The new areacode does not exists, so address for customer Emanuel Moody, with ID = 1, has been successfully updated and new areacode has been successfully created.

```
-bash-3.2$ db2 "SELECT * FROM Customers WHERE firstname='Emanuel' AND lastname='Moody' AND phone='514-212-6366'"
```

CID	FIRSTNAME	LASTNAME	ADDRESS	PHONE
1	Emanuel	Moody	782 Sherbrooke street	514-212-6366

1 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM AreaCode"
```

POSTALCODE

H3A1G1

H4M2C3

H4M2G9

H4M2H3

H4M2K3

H4M2K4

6 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Lives_in WHERE cid=1"
```

CID	POSTALCODE
1	H3A1G1

1 H3A1G1

1 record(s) selected.

6. Customer places an order using online. Ask for customer's first name, last name, phone number, address, and the menus they would like to order. If we have record for the customer, use it's *cid* to process the menu, otherwise create new customer.

Screenshot of terminal:

Options:

- 1) Add a new customer.
- 2) Add a new staff.
- 3) Add a new menu item.
- 4) For Order - check whether the order has been delivered or not.
- 5) For Existing Customer - moves to a new place.
- 6) For Customer - place a new order using online.
- 7) Quit

Please choose an option number: 6

Enter customer's first name:

Tina

Enter customer's last name:

Morris

Enter customer's phone number in the following format 000-000-0000:

514-439-1412

Enter mid of the menu you would like to order (if done type 0):

1

Enter mid of the menu you would like to order (if done type 0):

11

Enter mid of the menu you would like to order (if done type 0):

16

Enter mid of the menu you would like to order (if done type 0):

0

A new order has been started.

```
-bash-3.2$ db2 "SELECT * FROM Customers WHERE firstname='Tina' AND lastname='Morris' AND phone='514-439-1412'"
```

CID	FIRSTNAME	LASTNAME	ADDRESS	PHONE
4	Tina	Morris	989 Juliette street	514-439-1412

1 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Done_by"
```

OID	CID
1	1
2	2
3	3
4	4
5	5
6	1
7	3
8	4

8 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Order WHERE oid=8"
```

OID	METHOD
8	online

1 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Comes_from WHERE oid=8"
```

OID	POSTALCODE
8	H4M2G9

1 record(s) selected.

```
-bash-3.2$ db2 "SELECT * FROM Used_to WHERE oid=8"
```

OID	MID
-----	-----

8	1
8	11
8	16

3 record(s) selected.

7. Quit

4. Index

1. `CREATE INDEX staff_firstname ON Staff(firstName)`
Creating an index for the first name attribute in the Staff relation is useful because it is assumed that very little data modifications will be required. Thus indexing this field would not require frequent updates of the indexing structure. Second, the cardinality of this field is high meaning that there can be many variations of the first name field making indexing very advantageous. Third, many complex queries involve using this field, thus indexing this attribute would greatly increase performance since a search for this field would be $O(\log N)$ instead of $O(N)$.
2. `CREATE INDEX staff_lastname ON Staff(lastName)`
Similarly to 1.
3. `CREATE INDEX customers_firstname ON Customers(firstName)`
Similarly to 1.
4. `CREATE INDEX customers_lastname ON Customers(lastName)`
Similarly to 1.
5. `CREATE INDEX menu_price ON Menu(price)`
Similarly to 1.

[illegible]