Thanks Corporation Database Project
CMSI 486 Enterprise Project
Fall 2014

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This project designs and implements a database for an employee recognition system for companies to use internally.

Contents

Chapter III

Description of the Enterprise

Thanks is an effective, entirely digital, multi-purpose employee recognition system. The database will consist of many different companies who will pay for a service that makes recognizing employees simple and meaningful. This will allow the Thanks database to be used in a way that is unique to each company using the service.

The enterprise in question will make it much easier for employees to recognize one another across their company. As companies grow, it becomes difficult to maintain an atmosphere of employee worth. This growing size represents a problem as individual employees can feel like their work goes unnoticed in their company. Thanks provides a remedy for that by providing a digital way to send recognition to any employee quickly.

When opening the thanks form, it will be necessary to present a list of all employees in the company. A list of employees would appear with these attributes: name, position and department. If they saw a fellow employee do something, they should not feel uncertain about what position that employee currently occupies. One of the major goals of Thanks is to help people recognize each other regardless of rank in the company and title. Informing users about a person's job title will provide clarity into who they are thanking and their role in the organization. Users will be able to send other users the primary data type known as Thanks. For each thank, we have a user that gives the Thanks and a user that receives the Thanks. This demonstrates the personal aspect of recognition, as an employee recognizes a specific employee directly.

A Thanks also contains an area for an employee to write a message so they can explain what they are thanking the employee for. This allows for personalization of the Thanks so that employees can be detailed on the outstanding work their coworkers are doing. Finally, companies will be able to define a custom attribute for the last part of the Thanks, which will be represented as values the company wants to promote. The advantage of this value is that companies, depending on their mission statements and core beliefs, will be able to tailor this field to encourage specific attributes that represent the company within employees.

Thanks represents a social network within a company than it is a private thanking system. Messages will display on a live feed all of the Thanks being given around the company. Employees will be able to easily see the interaction and encouragement being spread amongst their acquaintances. The potential of Thanks is enormous, which is why a specific structure around a public space of thanks combined with personalized instances and explanations of employee worth are necessary in this database design.

Here are a set of questions employees may pose when retrieving data:

1. List the names of all employees in the company.
2. Which department has received the most Thanks in the company?
3. Return a list of all employees who have nicknames.
4. List all company values for the company.
5. Which department head has received the most Thanks in the company?
6. Which one of an employee's thanks they gave received the most likes?
7. Who has never received a Thanks within a company?
8. Who is the newest employee to have joined the company?
9. What Thanks were posted in the database on October 20, 2014?
10. List the most awarded company value.

Chapter IV

Definition of Environment

IV.1 Input and Report Forms

- Thanks Form
  - Name of Employee Being Thanked
  - Message
  - Company Value (optional)
    Represents a custom value that the company wants to encourage in their employees
- Employee Profile Page
  Allows for editing of a specific employee's profile. Some of the values stored in the database will not be able to be changed, such as Real Name and Job Title, and must be updated by an admin.
  - Edit Employee's Nickname
  - Edit Employee's Photo
- "Thanks Feed" of Company
  Allows employees to see the "Thanks Feed" of the company, a place where signed-in employees can like Thanks messages that have been given and comment/like those thanks messages.
- Thanks Item in "Thanks Feed"
  Allows an employee to take action on a Thanks item within the "Thanks Feed".
  - Like Current Message
    Allows employee to like a Thanks Given, whether addressed directly or external from the employee.
  - Comment on Current Message
    A comment is a text response to a Thanks Given, whether addressed directly or external from the employee.
- Admin Panel for Department
  Allows for department heads to manage information about their department.
  - Edit Department Title
    If the title of a department changes slightly, a department head is able to change this.

  - Edit Department Description
    Allows department head to change the department description information.
  - Edit Department Employee's Job Title
    Allows department head to select a specific employee's job title in their department and edit it.

- Admin Panel for Executive
  Allows for executives to manage information about their company, and to change even department-level information.
  - Edit Company Title
    Allows executives to change their company name if their corporation undergoes a name change.
  - Edit Company Founded Date
    Allows executives to set the founding date of the company.
  - Set Department Heads
    Allows executives to set the head of each department.

- Webmaster Panel for DB Manager
  Since Thanks Corporation is a business that provides its database service to other companies, a webmaster needs an admin panel to manage the many companies in the database.
  - View Companies in Database
    Allows webmaster to view all companies in the database
  - Edit Companies in Database
    Allows webmaster to deactivate companies or remove companies from database.

IV.2 Assumptions

1. Fellow employees address thanks to other employees.
2. Each employee is assigned an account, which has predefined data and some limited customization/personalization.
3. Employees can view a newsfeed-like interface of all thanks being given throughout the company.
4. Employees have the ability to view and like/comment on all Thanks company-wide.
5. Department heads will be able to manage their department info and certain employee info.
6. Executives will be able to manage department heads and company info.

IV.3 User-Oriented Data Dictionary

Datum	Information Definition
comment_data	Text data contained within a comment on a Thanks data type
companies	View of companies for a webmaster of Thanks
company_title	Title of a company using Thanks
company_value	Value being exuding that represents the company in the Thanks
department_description	Description of particular department in text form
department_title	The name of a particular department within the company
employee_department	Department employee works in
employee_name	Name of employee in the company, form
employee_nickname	Nickname of an employee
employee_photo	Photo of an employee for the Thanks database
employee_title	Job title of an employees position
founded_date	Date that a company was founded
like_data	Stored when an employee likes a Thanks another employee game
message_data	Text data contained within the body of a Thanks data type
thanks_feed	List of all Thanks in a corporation

IV.4 Cross-Reference Table

Datum	Form/Screen						
	Thanks Form	**Employee Profile**	**"Thanks Feed"**	**Thanks Item**	**Department Admin Panel**	**Executive Admin Panel**	**Webmaster Admin Panel**
comment_data			X	X			
companies							X
company_title			X			X	
company_value	X						
department_description					X		
department_title					X		
employee_department		X		X			
employee_name	X	X		X	X	X	
employee_nickname		X		X	X	X	
employee_photo		X		X			
employee_title		X		X	X	X	
founded_date						X	
like_data			X	X			
message_data	X		X	X			
thanks_feed			X				

Chapter V

Enterprise Database Design

V.1 Logical Model of the Enterprise

V.1.1 List of Entities and Attributes

- Employee
  - eid: Employee ID
  - name: Employee Name
  - job_title: Employee Job Title
  - photo: Employee Photo
  - nickname: Employee Nickname
  - started: Date the Employee Started
- Department
  - did: Department ID
  - depTitle: Department Title
  - depDescription: Department Description
- Company
  - cid: Company ID
  - cTitle: Company Title
  - founded_date: Date Company was Founded
- Thanks
  - tid: Thanks ID
  - thanksdate: Date Thanks was Given
- Like
  - likeid: Like ID
  - likedate: Date Like was Given
- Comment

  - commentid: Comment ID
  - comment_data: Comment Message
  - commentdate: Date Comment was Given
- Message
  - mid: Message ID
  - message_text: Text of Message
- Company Value
  - vid: Company Value ID
  - value_type: type of company value

V.1.2 List of Relationships and Attributes

- COMPANY_OF_DEPARTMENT(did, cid)
  CK - did

- DEPARTMENT_OF_EMPLOYEE(eid, did)
  CK - eid

- THANKS_TO(to,eid)
  CK - to

- THANKS_FROM(from,eid)
  CK - from

- THANKS_MESSAGE(tid,mid)
  CK - tid

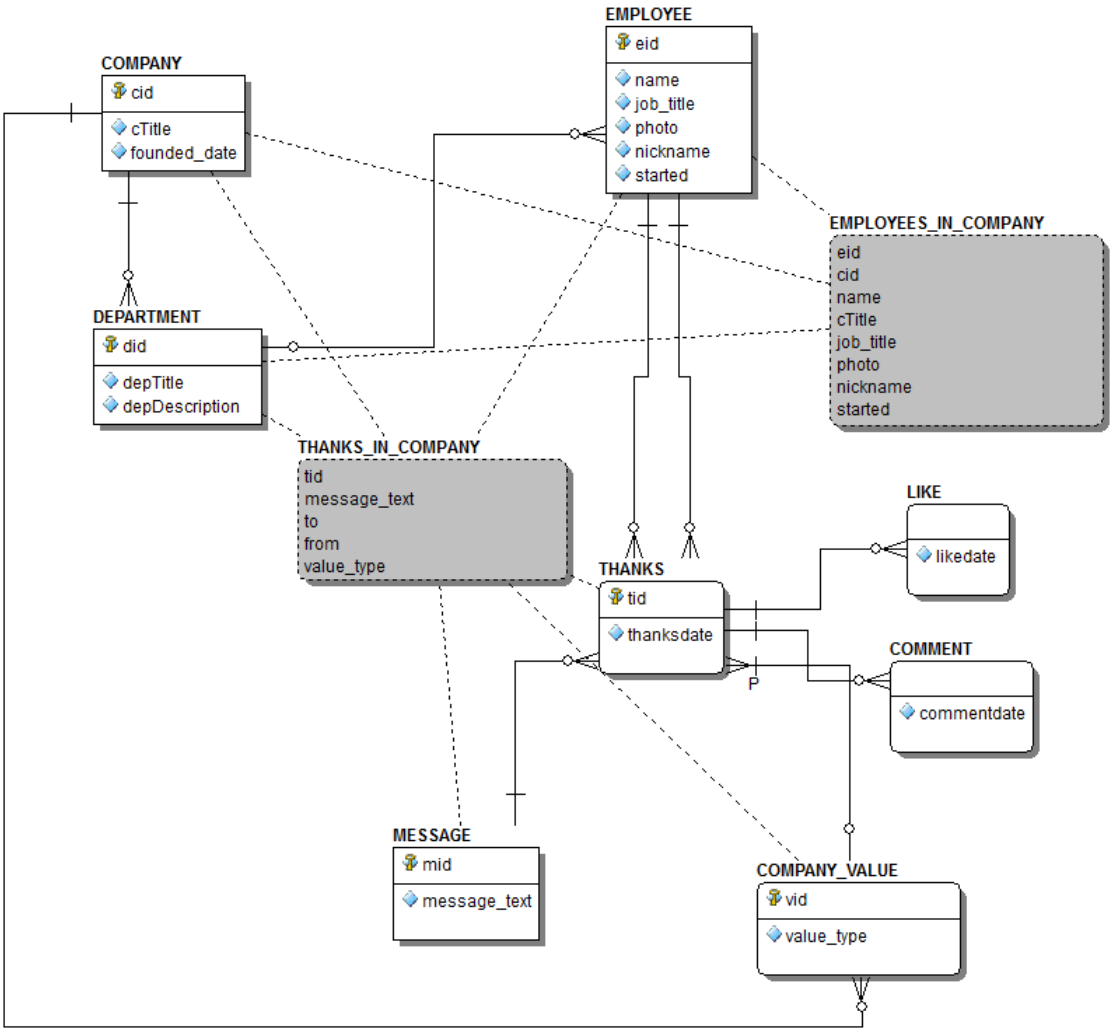
- THANKS_LIKE(likeid,tid)
  CK - likeid

- THANKS_COMMENT(commentid,tid)
  CK - commentid

- THANKS_VALUE(thanks.vid,company_value.vid)
  CK - thanks.vid

- VALUES_OF_COMPANY(cid, vid)
  CK - cid

V.1.3 Entity-Relationship Diagram of the Enterprise



V.2 Conceptual Model of the Enterprise

A conceptual model of the Thanks database.

company(cid, cTitle, founded_date)
PK - cid
CK - cid, cTitle
AK - cTitle

department(did, depTitle, depDescription)
PK - did
CK - did
FK - department.headid REFERENCES departmenthead.headid
department.cid REFERENCES company.cid

employee(eid, name, job_title, photo, nickname, started)
PK - eid
CK - eid, name, photo
AK - name, photo
FK - employee.did REFERENCES department.did

thanks((tid, mid), thanksdate)
PK - (tid, mid)
CK - tid
FK - thanks.mid REFERENCES message.mid
thanks.to REFERENCES employee.eid
thanks.from REFERENCES employee.eid
thanks.vid REFERENCES company_value.vid

like((likeid, tid), likedate)
PK - (likeid, tid)
CK - likeid
FK - like.tid REFERENCES thanks.tid

comment((commentid, tid), comment_data, commentdate)
PK - (commentid, tid)
CK - commentid
FK - comment.tid REFERENCES thanks.tid

message(mid, message_text)
PK - mid
CK - mid

company_value(vid, value_type)
PK - vid
CK - vid
FK - company_value.cid REFERENCES company.cid

V.3 Table Dictionary

Table	Attributes	Definition
COMPANY	cid, cTitle, founded_date	Represents a company, which is the starting data point
DEPARTMENT	did, depTitle, depDescription, headid, cid	Department in a company
EMPLOYEE	eid, name, job_title, photo, nickname, started, did	Employee in a company
THANKS	tid, thanksdate	Data type used to recognize another employee
LIKE	likeid, tid, likedate	A like on a Thanks post
COMMENT	commentid, tid, comment-date, comment_data	A comment on a Thanks post
MESSAGE	mid, message_text	Message of a Thanks
COMPANY_VALUE	vid, value_type	Company value of a Thanks
EMPLOYEES_IN_COMPANY	eid, cid, name, cTitle, job_title, photo, nickname, started	View of employees and their respective companies
THANKS_IN_COMPANY	tid, message_text, to, from, thanksdate, value_type	View of Thanks and their respective attributes

V.4 Attribute Dictionary

Attribute	Tables Used In	Description
eid	EMPLOYEE, EMPLOYEES_IN_COMPANY	Unique identifier of an employee
name	EMPLOYEE, EMPLOYEES_IN_COMPANY	Name of an employee
job_title	EMPLOYEE, EMPLOYEES_IN_COMPANY	Job title of employee
photo	EMPLOYEE, EMPLOYEES_IN_COMPANY	Photo of employee
nickname	EMPLOYEE, EMPLOYEES_IN_COMPANY	Nickname of employee
started	EMPLOYEE, EMPLOYEES_IN_COMPANY	Date that the employee started at their company
did	DEPARTMENT	Unique identifier of the department of a company
depTitle	DEPARTMENT	Name (title) of the department
depDescription	DEPARTMENT	Description of the department
cid	COMPANY, EMPLOYEES_IN_COMPANY	Unique identifier of a company
cTitle	COMPANY, EMPLOYEES_IN_COMPANY	Name (title) of a company
founded_date	COMPANY	Date a company was founded
tid	THANKS, THANKS_IN_COMPANY	Unique identifier of a Thanks
thanksdate	THANKS, THANKS_IN_COMPANY	Date the Thanks was given
likeid	LIKE	Unique identifier of a like on a Thanks
likedate	LIKE	Date the like was given
commentid	COMMENT	Unique identifier of a comment
comment_data	COMMENT	Message of comment
commentdate	COMMENT	Date the comment was added to the Thanks
mid	MESSAGE	Unique identifier of the message of a Thanks
message_text	MESSAGE, THANKS_IN_COMPANY	Body text of the message of a Thanks
vid	COMPANY_VALUE	Unique identifier of a company value
value_type	COMPANY_VALUE, THANKS_IN_COMPANY	Name (type) of company value

Chapter VI

Database and Query Definition

VI.1 Database Definition

```
--
-- ER/Studio Data Architect 9.6 SQL Code Generation
-- Project :      ThanksCorp.DM1
--
-- Date Created : Tuesday, November 25, 2014 23:37:27
-- Target DBMS : MySQL 5.x
--

--
-- TABLE: COMMENT
--

CREATE TABLE COMMENT(
    commentid       INT            NOT NULL AUTO_INCREMENT,
    tid             INT            NOT NULL,
    commentdate     DATE           NOT NULL,
    comment_data    VARCHAR(255)   NOT NULL,
    PRIMARY KEY (commentid, tid)
)ENGINE=INNODB
;



--
-- TABLE: COMPANY
--

CREATE TABLE COMPANY(
    cid             INT            NOT NULL AUTO_INCREMENT,
    cTitle          VARCHAR(30)    NOT NULL,
    founded_date    DATE           NOT NULL,
    PRIMARY KEY (cid)
```

```
)ENGINE=INNODB
;



--
-- TABLE: COMPANY_VALUE
--

CREATE TABLE COMPANY_VALUE(
    vid           INT            NOT NULL AUTO_INCREMENT,
    cid           INT            NOT NULL,
    value_type    VARCHAR(30)    NOT NULL,
    PRIMARY KEY (vid, cid)
)ENGINE=INNODB
;



--
-- TABLE: DEPARTMENT
--

CREATE TABLE DEPARTMENT(
    did               INT             NOT NULL AUTO_INCREMENT,
    depTitle          VARCHAR(30)     NOT NULL,
    depDescription    VARCHAR(255),
    cid               INT             NOT NULL,
    PRIMARY KEY (did)
)ENGINE=INNODB
;



--
-- TABLE: EMPLOYEE
--
-- note: photo changed from BLOB to VARCHAR for ease of demo

CREATE TABLE EMPLOYEE(
    eid          INT            NOT NULL AUTO_INCREMENT,
    name         VARCHAR(30)    NOT NULL,
    job_title    VARCHAR(30)    NOT NULL,
    photo        VARCHAR(30),
    nickname     VARCHAR(30),
    started      DATE           NOT NULL,
    did          INT,
    PRIMARY KEY (eid)
```

```
)ENGINE=INNODB
;



--
-- TABLE: LIKE
--

CREATE TABLE `LIKE`(
    likeid      INT             NOT NULL AUTO_INCREMENT,
    tid         INT             NOT NULL,
    likedate    DATETIME        NOT NULL,
    PRIMARY KEY (likeid, tid)
)ENGINE=INNODB
;



--
-- TABLE: MESSAGE
--

CREATE TABLE MESSAGE(
    mid             INT           NOT NULL AUTO_INCREMENT,
    message_text    VARCHAR(255),
    PRIMARY KEY (mid)
)ENGINE=INNODB
;



--
-- TABLE: THANKS
--

CREATE TABLE THANKS(
    tid           INT             NOT NULL AUTO_INCREMENT,
    mid           INT             NOT NULL,
    `to`          INT             NOT NULL,
    `from`        INT             NOT NULL,
    vid           INT,
    thanksdate    DATETIME        NOT NULL,
    cid           INT,
    PRIMARY KEY (tid, mid)
)ENGINE=INNODB
;
```

```
--
-- VIEW: EMPLOYEES_IN_COMPANY
--

CREATE VIEW EMPLOYEES_IN_COMPANY AS (
    SELECT e.eid
             , c.cid
             , e.name
             , c.cTitle
             , e.job_title
             , e.photo
             , e.nickname
             , e.started
    FROM COMPANY as c
            INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
            INNER JOIN EMPLOYEE AS e ON e.did = d.did
)
;

--
-- VIEW: THANKS_IN_COMPANY
--

CREATE VIEW THANKS_IN_COMPANY AS (
    SELECT t.tid
         , m.message_text
         , t.`to`
         , t.`from`
         , t.thanksdate
         , cv.value_type
    FROM COMPANY as c
        INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
        INNER JOIN EMPLOYEE AS e ON e.did = d.did
        INNER JOIN THANKS AS t ON t.to = e.eid
        INNER JOIN MESSAGE AS m ON t.mid = m.mid
        INNER JOIN COMPANY_VALUE as cv ON t.vid = cv.vid
)
;

--
-- TABLE: COMMENT
--

ALTER TABLE COMMENT ADD CONSTRAINT RefTHANKS20
    FOREIGN KEY (tid)
    REFERENCES THANKS(tid)
;
```

```
--
-- TABLE: COMPANY_VALUE
--

ALTER TABLE COMPANY_VALUE ADD CONSTRAINT RefCOMPANY33
    FOREIGN KEY (cid)
    REFERENCES COMPANY(cid)
;


--
-- TABLE: DEPARTMENT
--

ALTER TABLE DEPARTMENT ADD CONSTRAINT RefCOMPANY32
    FOREIGN KEY (cid)
    REFERENCES COMPANY(cid)
;


--
-- TABLE: EMPLOYEE
--

ALTER TABLE EMPLOYEE ADD CONSTRAINT RefDEPARTMENT30
    FOREIGN KEY (did)
    REFERENCES DEPARTMENT(did)
;


--
-- TABLE: LIKE
--

ALTER TABLE `LIKE` ADD CONSTRAINT RefTHANKS19
    FOREIGN KEY (tid)
    REFERENCES THANKS(tid)
;


--
-- TABLE: THANKS
--

ALTER TABLE THANKS ADD CONSTRAINT RefCOMPANY_VALUE17
    FOREIGN KEY (vid, cid)
    REFERENCES COMPANY_VALUE(vid, cid)
```

```
;

ALTER TABLE THANKS ADD CONSTRAINT RefEMPLOYEE22
    FOREIGN KEY (`to`)
    REFERENCES EMPLOYEE(eid)
;

ALTER TABLE THANKS ADD CONSTRAINT RefEMPLOYEE24
    FOREIGN KEY (`from`)
    REFERENCES EMPLOYEE(eid)
;

ALTER TABLE THANKS ADD CONSTRAINT RefMESSAGE31
    FOREIGN KEY (mid)
    REFERENCES MESSAGE(mid)
;
```

VI.2 Database Queries

Given below are 14 example English queries, with their SQL DML used to retrieve the necessary data.

1. List the names of all employees in the company "I Love Thanks".

```
SELECT name
FROM   EMPLOYEES_IN_COMPANY
WHERE  cTitle = "I Love Thanks"
;
```

2. Show all department names in the corporation "Blitz".

```
SELECT d.depTitle
FROM COMPANY AS c
    INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
WHERE c.cTitle = "Blitz"
;
```

3. Return a list of all employees in the database who have nicknames.

```
SELECT e.nickname, e.name
FROM EMPLOYEE AS e
WHERE e.nickname IS NOT NULL
;
```

4. Show names of employees who do not have photos in the "I Love Thanks" company.

```
SELECT e.name
FROM COMPANY AS c
    INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
    INNER JOIN EMPLOYEE   AS e ON d.did = e.did
WHERE e.photo IS NULL
    AND c.cTitle = "I Love Thanks"
;
```

5. Show all comments on Julia Crow's Thanks to Richard Baker on January 2, 2011.

```
SELECT commentdate, comment_data
FROM COMMENT
WHERE tid = (
    SELECT t.tid
    FROM THANKS_IN_COMPANY AS t
    WHERE t.to = (
        SELECT eid
        FROM   EMPLOYEES_IN_COMPANY
        WHERE  name = "Richard Baker"
    )
    AND t.from = (
        SELECT eid
        FROM   EMPLOYEES_IN_COMPANY
        WHERE  name = "Julia Crow"
    )
    AND t.thanksdate = "2011-1-2"
)
;
```

6. Show all of the Thanks that Julia Crow from "First America" gave.

```
SELECT e.name, t.`to`, m.message_text
FROM COMPANY AS c
    INNER JOIN DEPARTMENT AS d ON c.cid    = d.cid
    INNER JOIN EMPLOYEE   AS e ON d.did    = e.did
    INNER JOIN THANKS     AS t ON t.`from` = e.eid
    INNER JOIN MESSAGE    AS m ON t.mid    = m.mid
WHERE c.cTitle = "First America"
    AND e.name = "Julia Crow"
;
```

7. Show all of the Thanks that Emma Cross from "Lightning Corporation" received.

```
SELECT e.name, t.‘from‘, m.message_text
FROM COMPANY AS c
    INNER JOIN DEPARTMENT AS d ON c.cid  = d.cid
    INNER JOIN EMPLOYEE   AS e ON d.did  = e.did
    INNER JOIN THANKS     AS t ON t.‘to‘ = e.eid
    INNER JOIN MESSAGE    AS m ON t.mid  = m.mid
WHERE c.cTitle = "Lightning Corporation"
    AND e.name = "Emma Cross"
;
```

8. Show all thanks that have been given in the corporation “First America” before 2013.

```
SELECT t.to, t.from, m.message_text, t.thanksdate, cv.value_type
FROM COMPANY AS c
    INNER JOIN DEPARTMENT    AS d  ON c.cid  = d.cid
    INNER JOIN EMPLOYEE      AS e  ON d.did  = e.did
    INNER JOIN THANKS        AS t  ON t.‘to‘ = e.eid
    INNER JOIN COMPANY_VALUE AS cv ON t.vid  = cv.vid
    INNER JOIN MESSAGE       AS m  ON t.mid  = m.mid
WHERE c.cTitle = "First America"
    AND t.thanksdate < ’2013-1-1’
;
```

9. List the company values of “Blitz”.

```
SELECT cv.value_type
FROM   COMPANY AS c
    INNER JOIN COMPANY_VALUE as cv on c.cid = cv.cid
WHERE  c.cTitle = "Blitz"
;
```

10. Who is the newest employee to have joined the company “Lightning Corporation”?

```
SELECT e.name
FROM COMPANY AS c
    INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
    INNER JOIN EMPLOYEE   AS e ON d.did = e.did
WHERE c.cTitle = "Lightning Corporation"
    AND e.started = (
        SELECT MAX(e.started)
        FROM COMPANY AS c
            INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
            INNER JOIN EMPLOYEE   AS e ON d.did = e.did
        WHERE c.cTitle = "Lightning Corporation"
    )
;
```

11. List all Thanks "I Love Thanks" employees gave in October 2011.

```
SELECT t.to, t.from, m.message_text, t.thanksdate, cv.value_type
FROM COMPANY AS c
    INNER JOIN DEPARTMENT    AS d  ON c.cid  = d.cid
    INNER JOIN EMPLOYEE      AS e  ON d.did  = e.did
    INNER JOIN THANKS        AS t  ON t.`to` = e.eid
    INNER JOIN COMPANY_VALUE AS cv ON t.vid  = cv.vid
    INNER JOIN MESSAGE       AS m  ON t.mid  = m.mid
WHERE MONTHNAME(t.thanksdate) = "October"
    AND YEAR(t.thanksdate) = 2011
;
```

12. Find the name of the employee who received the most Thanks in "Blitz".

```
SELECT e.name
FROM COMPANY AS c
    INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
    INNER JOIN EMPLOYEE   AS e ON d.did = e.did
    INNER JOIN THANKS     AS t ON t.to  = e.eid
WHERE c.cTitle = "Blitz"
    AND t.to = (
        SELECT `to` FROM (
            SELECT `to`, count(`to`) AS counted
            FROM COMPANY AS c
                INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
                INNER JOIN EMPLOYEE   AS e ON d.did = e.did
                INNER JOIN THANKS     AS t ON t.to  = e.eid
            WHERE c.cTitle = "Blitz"
            GROUP BY `to`
            ORDER BY counted DESC
            LIMIT 1
        ) as received_most_thanks
    )
    GROUP BY `to`
;
```

13. Find the average number of likes each Thanks in the corporation "Blitz" received in 2011.

```
SELECT AVG(avg.counter)
FROM (
    SELECT l.tid, count(l.likeid) as counter
    FROM COMPANY AS c
        INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
        INNER JOIN EMPLOYEE   AS e ON d.did = e.did
        INNER JOIN THANKS     AS t ON t.to  = e.eid
```

```
        INNER JOIN `LIKE`     AS l ON t.tid = l.tid
    WHERE c.cTitle = "Blitz"
    AND   YEAR(t.thanksdate) = 2011
    GROUP BY l.tid
) AS avg
;
```

14. Find the most awarded company value in "Blitz".

```
SELECT cv.value_type
FROM COMPANY AS c
    INNER JOIN DEPARTMENT    AS d  ON c.cid = d.cid
    INNER JOIN EMPLOYEE      AS e  ON d.did = e.did
    INNER JOIN THANKS        AS t  ON e.eid = t.to
    INNER JOIN COMPANY_VALUE AS cv ON t.vid = cv.vid
WHERE c.cTitle = "Blitz"
GROUP BY value_type
ORDER BY COUNT(VALUE_TYPE) DESC
LIMIT 1
;
```

VI.3 Design Tradeoffs and Limitations

One of the biggest design tradeoffs is that an employee can only be associated with one company. This can become difficult if an employee leaves a company and wants to take their data with them to a new company. An example of this can be seen more clearly when the attribute "started" is taken into account. If an employee is starting in a new position, this date has to change and is no longer preserved. However, since the idea of Thanks Corporation is to maintain a private way to share Thanks within a company, this seemed to be a fair tradeoff. The "started" example is a more difficult limitation of the database, but necessary without another entity.

Another tradeoff of the database is the lack of multiple job titles. Multiple photos are also not allowed, so if transferring between companies were ever a feature in the future, these would not work in a future implementation. Another design limitation is the lack of Thanks being given between corporations. Since I wanted to keep the database as small communities of corporations rather than one large social network, it seemed to be the right tradeoff.

Chapter VII

Database Integrity and Security

VII.1 Functional Dependencies

- cid → cTitle, founded_date
- did → depTitle, depDescription
- eid → name, job_title, photo, nickname, started
- tid → thanksdate
- likeid → likedate
- commentid → comment_data, commentdate
- mid → message_text
- vid → value_type

VII.2 Adjustments for Normalization

According to these functional dependencies and after looking at the ERD, it is clear that the database has already been normalized. Therefore, no adjustments will be needed on top of what already is in normalizing this database.

VII.3 Integrity and Security

1. Users and Granted Privileges
   There will multiple types of access privileges to the database. These access types are listed below.
   - Webmaster User
     A webmaster represents access privileges for the owner of Thanks Corporation. He has complete access to all data at any time.
   - Executive User
     Allows access to an executive's own company entity, and allows for modification of its attributes.

- Department Head User
  Allows access to a department head's own department entity, and allows for modification of its attributes.
- Employee User
  Allows normal access for an employee: modification of own employee entity and insert/update/delete privileges for own Thanks and related entities.

2. Assertion
   MySQL does not directly provide assertions, however triggers have been used to provide assertion-like functionality in MySQL. Assertions the Thanks Corporation needs are listed below.

   - Determine whether an employee giving a Thanks with a company value is using a company value from the employee's own company.

3. Views
   Two views are utilized in this database.

   - EMPLOYEES_IN_COMPANY
     Returns employees from all departments associated with a company.
   - THANKS_IN_COMPANY
     Returns all thanks from within a company.

Chapter VIII

Implementation Notes

VIII.1 Indices

Refer to section IV.1 for a list of used indices.

VIII.2 Data

```
--
-- DATA LOAD for Thanks Corporation
--

CREATE TABLE IF NOT EXISTS COMPANY(
    cid             INT             NOT NULL AUTO_INCREMENT,
    cTitle          VARCHAR(30)     NOT NULL,
    founded_date    DATE            NOT NULL,
    PRIMARY KEY (cid)
)ENGINE=INNODB
;

INSERT INTO COMPANY (cTitle, founded_date) VALUES
("Blitz", "2001-8-31"),
("I Love Thanks", "2005-8-15"),
("Playa Medical", "1930-5-2"),
("First America", "1993-7-17"),
("Lightning Corporation", "2001-9-12")
;


CREATE TABLE IF NOT EXISTS COMPANY_VALUE(
    vid           INT            NOT NULL AUTO_INCREMENT,
    cid           INT            NOT NULL,
    value_type    VARCHAR(30)    NOT NULL,
    PRIMARY KEY (vid, cid)
)ENGINE=INNODB
;
```

```
INSERT INTO COMPANY_VALUE(cid, value_type) VALUES
(1, "Integrity"),
(1, "Creativity"),
(1, "Ingenuity"),
(1, "Success"),
(2, "Helpfulness"),
(2, "Thankfulness"),
(2, "Caring"),
(2, "Focused"),
(3, "Helpful"),
(3, "Serving"),
(3, "Invaluable"),
(3, "Medical Star"),
(4, "Hardworking"),
(4, "Encouraging"),
(4, "Strategic"),
(4, "Successful"),
(5, "Fast"),
(5, "Comprehensive"),
(5, "Timely"),
(5, "Innovative")
;

CREATE TABLE IF NOT EXISTS DEPARTMENT(
    did               INT             NOT NULL AUTO_INCREMENT,
    depTitle          VARCHAR(30)     NOT NULL,
    depDescription    VARCHAR(255),
    cid               INT             NOT NULL,
    PRIMARY KEY (did)
)ENGINE=INNODB
;

INSERT INTO DEPARTMENT(depTitle, depDescription, cid) VALUES
("Administration", "The executive branch", 1),
("Technology", "We build the apps for Blitz.", 1),
("Creative", "The brain of the operation", 1),
("Communications", "We communicate well with others.", 1),
--
("Thanks1", "Thanks Department 1", 2),
("Thanks2", "Thanks Department 2", 2),
("Thanks3", "Thanks Department 3", 2),
("Thanks4", "Thanks Department 4", 2),
--
("Board", "Board of the Hospital", 3),
("Outpatient", "Outpatient Team", 3),
("Inpatient", "Inpatient Team", 3),
("ER", "Emergency Room Team", 3),
```

```
--
("Car Loan", "Giving people wheels.", 4),
("Home Loan", "Giving people homes.", 4),
("Banking", "Banking section of First America", 4),
("Mutual Funds", "Mutual Funds of First America", 4),
--
("Electricity", "We power this company.", 5),
("Human Relations", "HR Department of Lightning Corporation", 5),
("Power", "We humbly thank Electricity", 5),
("Thunder", "Lightning's Best Friend", 5)
;

-- Starts at 21
INSERT INTO DEPARTMENT(depTitle, cid) VALUES
("Strategy", 1),
("Thanks5", 2),
("Cancer Center", 3),
("Administration", 4),
("Lightning Execs", 5)
;

CREATE TABLE IF NOT EXISTS EMPLOYEE(
    eid          INT            NOT NULL AUTO_INCREMENT,
    name         VARCHAR(30)    NOT NULL,
    job_title    VARCHAR(30)    NOT NULL,
    photo        VARCHAR(30),
    nickname     VARCHAR(30),
    started      DATE           NOT NULL,
    did          INT,
    PRIMARY KEY (eid)
)ENGINE=INNODB
;

INSERT INTO EMPLOYEE(name, job_title, photo, nickname, started, did) VALUES
("William Smith", "CEO", "mountain tops", "Will", "2013-1-1", 1),
("Florence Johnson", "Department Head", "mountain tops", "Flo", "2010-4-6", 5),
("George Williams", "Finance", "mountain tops", "GW", "2008-9-15", 9),
("Thomas Brown", "Finance Manager", "mountain tops", "Tom", "2005-3-10", 13),
("Annie Jones", "Lead Engineer", "mountain tops", "Ann", "2013-1-1", 17)
;

INSERT INTO EMPLOYEE(name, job_title, photo, started, did) VALUES
("Frederick Martinez", "President", "mountain tops", "2008-9-15", 1),
("Elsie Anderson", "Assistant Director", "mountain tops", "2013-1-1", 5),
("Charles Taylor", "Public Relations", "mountain tops", "2005-3-10", 9),
("Dorothy Thomas", "Finance Associate", "mountain tops", "2013-1-1", 13),
("Albert Hernandez", "Electric Manager", "mountain tops", "1993-7-17", 17),
("Ethel Moore", "Senior Technology Officer", "mountain tops", "2010-2-9", 2),
```

```
("Robert Martin", "Department Head", "mountain tops", "2010-2-11", 6),
("Doris Jackson", "Head Nurse", "mountain tops", "2011-3-15", 10),
("Joseph Thompson", "Financial Manager", "mountain tops", "2008-11-15", 14),
("Margaret White", "HR Manager", "mountain tops", "2011-3-15", 18),
("Alfred Lopez", "Creative Director", "mountain tops", "2010-4-6", 3),
("Gladys Lee", "Department Head", "mountain tops", "2008-11-15", 7),
("Henry Gonzales", "Inpatient Manager", "mountain tops", "2013-1-1", 11),
("Sarah Harris", "Funds Manager", "mountain tops", "2008-9-15", 15),
("Ernest Clark", "Power Manager", "mountain tops", "2011-3-15", 19),
("Lillian Lewis", "Communications Manager", "mountain tops", "1993-7-17", 4),
("Harry Robinson", "Department Head", "mountain tops", "2013-1-1", 8),
("Ellen Walker", "MD", "mountain tops", "2008-9-15", 12),
("Harold Perez", "Mutual Fund Manager", "mountain tops", "2013-1-1", 16),
("Hilda Hall", "Thunder Manager", "mountain tops", "2014-5-6", 20),
("Edward Young", "Strategy Consultant", "mountain tops", "2010-4-6", 21),
("Lily Allen", "Department Head", "mountain tops", "2013-1-1", 22),
("Walter Sanchez", "Lead MD", "mountain tops", "1993-7-17", 23),
("Frank Wright", "Chief Financial Officer", "mountain tops", "2013-1-1", 24),
("Violet King", "CEO", "mountain tops", "2008-9-15", 25)
;

INSERT INTO EMPLOYEE(name, job_title, nickname, started, did) VALUES
("Henry Gonzales", "Strategy Consultant", "H", "2010-4-6", 21),
("Herbert Scott", "Thanks Assistant", "Herb", "2011-3-15", 22),
("Ada Green", "Assistant MD", "A", "2011-3-10", 23),
("Richard Baker", "Chief of Operations", "Rich", "2013-1-1", 24),
("Emily Adams", "Lightning Board Member", "Emma", "2005-3-10", 25)
;

INSERT INTO EMPLOYEE(name, job_title, started, did) VALUES
("May Roberts", "HR Manager", "2010-2-11", 1),
("Samuel Carter", "Thanks Associate", "2008-11-15", 5),
("Mabel Phillips", "Company Effectiveness Officer", "2013-1-1", 9),
("David Evans", "Loan Associate", "1993-7-17", 13),
("Ivy Turner", "Electrician", "2011-3-10", 17),
("Sidney Torres", "Senior Developer", "2010-4-6", 2),
("Rose Parker", "Thanks Worker", "2011-3-10", 6),
("Francis Collins", "Outpatient Desk Manager", "2008-9-15", 10),
("Gertrude Edwards", "Home Loan Associate", "2013-1-1", 14),
("Edward Bisiani", "HR Associate", "2014-1-1", 18),
("Stanley Stewart", "Main Strategy Officer", "2010-2-11", 21),
("Jane Flores", "Thanks Associate", "2005-3-10", 22),
("Fred Morris", "Front Desk", "2007-10-10", 23),
-- Query Specific Names
("Julia Crow", "Assistant CEO", "1993-7-17", 24),
("Emma Cross", "Executive Lightning Specialist", "2013-1-1", 25)
;
```

```
--
-- TABLE: MESSAGE
--

CREATE TABLE IF NOT EXISTS MESSAGE(
    mid             INT           NOT NULL AUTO_INCREMENT,
    message_text    VARCHAR(255),
    PRIMARY KEY (mid)
)ENGINE=INNODB
;

INSERT INTO MESSAGE(message_text) VALUES
("GREAT JOB!"),
("Keep up the good work!"),
("You really followed instructions well"),
("I'm very impressed with your work"),
("Keep it up!"),
("You have done a service for the company"),
("Keep working hard!"),
("Nice work"),
("You really helped me out"),
("Thanks for working with my team!"),
("You are really creative"),
("Good work"),
("Good work, keep it up!"),
("Nice work!"),
("Quickly finished this project"),
("Great job on the project!"),
("You collaborate well!"),
("You're a good employee and friend."),
("Thank you so much!"),
("You did awesome work on that project"),
("You're the MVP of this company"),
("Good at keeping pace and a pleasure to work with"),
("Thank you so much for your continuous hard work!"),
("Thanks again for the effort!"),
("Thoroughly impressed with your work.")
;

--
-- TABLE: THANKS
--

CREATE TABLE IF NOT EXISTS THANKS(
    tid           INT           NOT NULL AUTO_INCREMENT,
    mid           INT           NOT NULL,
    `to`          INT           NOT NULL,
    `from`        INT           NOT NULL,
```

```
    vid           INT,
    thanksdate    DATETIME       NOT NULL,
    cid           INT,
    PRIMARY KEY (tid, mid)
)ENGINE=INNODB
;

INSERT INTO THANKS(mid, `to`, `from`, vid, thanksdate, cid) VALUES
-- Emma Cross
(1, 50, 25, 17, "2010-1-2", 5),
(2, 50, 10, 17, "2010-5-6", 5),
(3, 50, 45, 18, "2010-11-1", 5),
-- Julia Crow
(4, 34, 49, 14, "2011-1-2", 4), -- Comment query
(5, 24, 49, 15, "2012-1-1", 4),
-- First America < 2011
(6, 39, 19, 16, "2012-2-4", 4),
(7, 4, 9, 13, "2012-12-31", 4),
-- I Love Thanks -> October 2011
(8, 2, 12, 5, "2011-10-1", 2),
(9, 12, 2, 6, "2011-10-2", 2),
-- Blitz most awarded company value
(10, 1, 6, 1, "2013-2-4", 1),
(11, 1, 36, 1, "2014-1-1", 1),
(12, 1, 41, 1, "2012-2-2", 1),
(13, 41, 36, 1, "2014-2-3", 1),
(14, 6, 1, 1, "2010-1-2", 1),
-- Employee who received most Thanks in Blitz
(15, 11, 1, 2, "2010-2-10", 1),
(16, 11, 16, 3, "2009-1-3", 1),
(17, 11, 21, 4, "2008-5-19", 1),
(18, 11, 11, 2, "2010-12-31", 1),
-- 2011 Thanks Average Likes Blitz
(19, 6, 16, 2, "2011-1-1", 1),
(20, 16, 6, 3, "2011-1-2", 1),
(21, 36, 41, 4, "2011-1-3", 1),
(22, 16, 11, 2, "2011-1-4", 1),
-- Random Thanks in Playa Medical
(23, 38, 22, 9, "2011-1-5", 3),
(24, 18, 38, 10, "2011-1-6", 3),
(25, 8, 18, 11, "2010-2-2", 3)
;

--
-- TABLE: LIKE
--

CREATE TABLE IF NOT EXISTS `LIKE`(
```

```
    likeid      INT             NOT NULL AUTO_INCREMENT,
    tid         INT             NOT NULL,
    likedate    DATETIME        NOT NULL,
    PRIMARY KEY (likeid, tid)
)ENGINE=INNODB
;

INSERT INTO `LIKE`(tid, likedate) VALUES
-- 2011 Average Likes Blitz
(19, "2011-2-4"),
(19, "2011-2-10"),
(19, "2011-2-23"),
(19, "2011-3-1"),
(20, "2011-6-21"),
(20, "2011-8-21"),
(21, "2011-9-1"),
(21, "2011-9-11"),
(21, "2011-11-2"),
-- Random Likes
(1, "2013-1-2"),
(5, "2014-5-6"),
(7, "2013-2-3"),
(8, "2014-8-9"),
(8, "2011-10-1"),
(10, "2013-2-4")
;

--
-- TABLE: COMMENT
--

CREATE TABLE IF NOT EXISTS COMMENT(
    commentid       INT             NOT NULL AUTO_INCREMENT,
    tid             INT             NOT NULL,
    commentdate     DATE            NOT NULL,
    comment_data    VARCHAR(255)    NOT NULL,
    PRIMARY KEY (commentid, tid)
)ENGINE=INNODB
;

INSERT INTO COMMENT(tid, commentdate, comment_data) VALUES
-- Comments on Julia Crow's Thanks to Richard Baker.
(4, "2011-1-2", "I totally agree!"),
(4, "2011-1-2", "Such kind words"),
(4, "2011-1-3", "Yeah! You go!"),
-- Random Comments
(10, "2013-5-6", "This was a thoughtful thing to say."),
(10, "2013-5-7", "I second this, keep it up"),
```

```
(14, "2010-1-2", "You're so nice!"),
(15, "2010-2-10", "Keep it up"),
(16, "2009-1-3", "So much encouragement!"),
(17, "2008-5-19", "Nice!")
;
```

VIII.3 Query Trace

A query trace is found on the next page.

Your SQL query has been executed successfully

```
-- List the names of all employees in the company "I Love Thanks".
SELECT name
FROM EMPLOYEES_IN_COMPANY
WHERE cTitle = "I Love Thanks"
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

name
Florence Johnson
Elsie Anderson
Samuel Carter
Robert Martin
Rose Parker
Gladys Lee
Harry Robinson
Lily Allen
Herbert Scott
Jane Flores

Your SQL query has been executed successfully

```
-- Show all department names in the corporation "Blitz".
SELECT d.depTitle
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
WHERE c.cTitle = "Blitz"
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

depTitle
Administration

depTitle
Technology
Creative
Communications
Strategy

Your SQL query has been executed successfully

```
-- Return a list of all employees in the database who have nicknames.
SELECT e.nickname, e.name
FROM EMPLOYEE AS e
WHERE e.nickname IS NOT NULL
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

nickname	name
Will	William Smith
Flo	Florence Johnson
GW	George Williams
Tom	Thomas Brown
Ann	Annie Jones
H	Henry Gonzales
Herb	Herbert Scott
A	Ada Green
Rich	Richard Baker
Emma	Emily Adams

Your SQL query has been executed successfully

```sql
-- Show names of employees who do not have photos in the "I Love Thanks" company.
SELECT e.name
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
WHERE e.photo IS NULL
AND c.cTitle = "I Love Thanks"
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

name
Samuel Carter
Rose Parker
Herbert Scott
Jane Flores

Your SQL query has been executed successfully

```sql
-- Show all comments on Julia Crow's Thanks to Richard Baker on January 2, 2011.
SELECT commentdate, comment_data
FROM COMMENT
WHERE tid = (
SELECT t.tid
FROM THANKS_IN_COMPANY AS t
WHERE t.to = (
SELECT eid
FROM EMPLOYEES_IN_COMPANY
WHERE name = "Richard Baker" )
AND t.from = (
SELECT eid
FROM EMPLOYEES_IN_COMPANY
WHERE name = "Julia Crow" )
AND t.thanksdate = "2011-1-2" )
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

commentdate	comment_data
2011-01-02	I totally agree!

commentdate	comment_data
2011-01-02	Such kind words
2011-01-03	Yeah! You go!

Your SQL query has been executed successfully

```
-- Show all of the Thanks that Julia Crow from "First America" gave.
SELECT e.name, t.`to` , m.message_text
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.`from` = e.eid
INNER JOIN MESSAGE AS m ON t.mid = m.mid
WHERE c.cTitle = "First America"
AND e.name = "Julia Crow"
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

name	to	message_text
Julia Crow	34	I'm very impressed with your work
Julia Crow	24	Keep it up!

Your SQL query has been executed successfully

```
-- Show all of the Thanks that Emma Cross from "Lightning Corporation"
received.
SELECT e.name, t.`from` , m.message_text
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.`to` = e.eid
INNER JOIN MESSAGE AS m ON t.mid = m.mid
WHERE c.cTitle = "Lightning Corporation"
AND e.name = "Emma Cross"
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

name	from	message_text
Emma Cross	25	GREAT JOB!

name	from	message_text
Emma Cross	10	Keep up the good work!
Emma Cross	45	You really followed instructions well

Your SQL query has been executed successfully

```
-- Show all thanks that have been given in the corporation "First America" before 2013.
SELECT t.to, t.from, m.message_text, t.thanksdate, cv.value_type
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.`to` = e.eid
INNER JOIN COMPANY_VALUE AS cv ON t.vid = cv.vid
INNER JOIN MESSAGE AS m ON t.mid = m.mid
WHERE c.cTitle = "First America"
AND t.thanksdate < '2013-1-1'
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

to	from	message_text	thanksdate	value_type
4	9	Keep working hard!	2012-12-31 00:00:00	Hardworking
39	19	You have done a service for the company	2012-02-04 00:00:00	Successful
24	49	Keep it up!	2012-01-01 00:00:00	Strategic
34	49	I'm very impressed with your work	2011-01-02 00:00:00	Encouraging

Your SQL query has been executed successfully

```
-- List the company values of "Blitz".
SELECT cv.value_type
FROM COMPANY AS c
INNER JOIN COMPANY_VALUE AS cv ON c.cid = cv.cid
WHERE c.cTitle = "Blitz"
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

value_type

value_type

Integrity
Creativity
Ingenuity
Success

Your SQL query has been executed successfully

```
-- Who is the newest employee to have joined the company "Lightning
Corporation"?
SELECT e.name
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
WHERE c.cTitle = "Lightning Corporation"
AND e.started = (
SELECT MAX( e.started )
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
WHERE c.cTitle = "Lightning Corporation" )
```

[Inline] [Edit] [Create PHP Code]

name

Hilda Hall

Your SQL query has been executed successfully

```
-- List all Thanks "I Love Thanks" employees gave in October 2011.
SELECT t.to, t.from, m.message_text, t.thanksdate, cv.value_type
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.`to` = e.eid
INNER JOIN COMPANY_VALUE AS cv ON t.vid = cv.vid
INNER JOIN MESSAGE AS m ON t.mid = m.mid
WHERE MONTHNAME( t.thanksdate ) = "October"
AND YEAR( t.thanksdate ) =2011
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

to	from	message_text	thanksdate	value_type
2	12	Nice work	2011-10-01 00:00:00	Helpfulness
12	2	You really helped me out	2011-10-02 00:00:00	Thankfulness

Your SQL query has been executed successfully

```
-- Find the name of the employee who received the most Thanks in "Blitz".
SELECT e.name
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.to = e.eid
WHERE c.cTitle = "Blitz"
AND t.to = (
SELECT `to`
FROM (

SELECT `to` , COUNT( `to` ) AS counted
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.to = e.eid
WHERE c.cTitle = "Blitz"
GROUP BY `to`
ORDER BY counted DESC
LIMIT 1 ) AS received_most_thanks
)
GROUP BY `to`
LIMIT 0 , 30
```

[Inline] [Edit] [Create PHP Code]

name
Ethel Moore

Your SQL query has been executed successfully

```sql
-- Find the average number of likes each Thanks in the corporation "Blitz"
received in 2011.
SELECT AVG( avg.counter )
FROM (

SELECT l.tid, COUNT( l.likeid ) AS counter
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON t.to = e.eid
INNER JOIN `LIKE` AS l ON t.tid = l.tid
WHERE c.cTitle = "Blitz"
AND YEAR( t.thanksdate ) =2011
GROUP BY l.tid
) AS avg
```

[Inline] [Edit] [Create PHP Code]

AVG(avg.counter)
3.0000

Your SQL query has been executed successfully

```sql
-- Find the most awarded company value in "Blitz".
SELECT cv.value_type
FROM COMPANY AS c
INNER JOIN DEPARTMENT AS d ON c.cid = d.cid
INNER JOIN EMPLOYEE AS e ON d.did = e.did
INNER JOIN THANKS AS t ON e.eid = t.to
INNER JOIN COMPANY_VALUE AS cv ON t.vid = cv.vid
WHERE c.cTitle = "Blitz"
GROUP BY value_type
ORDER BY COUNT( VALUE_TYPE ) DESC
LIMIT 1
```

[Inline] [Edit] [Create PHP Code]

value_type
Integrity

VIII.4 Implementation Assessment

I had to adjust some of the data types, as my primary keys were not autoincrementing when I inserted new data. I also switched datetime to date for a few data types in order to maintain some consistency. Finally, I modified a database relation since it was conflicting with what I wanted. Overall, after those fixes all of the implementations went smoothly and I was able to get my query trace up and running quickly.

Chapter IX

Lessons Learned