MARIST

Club Management Database

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CMPT 308

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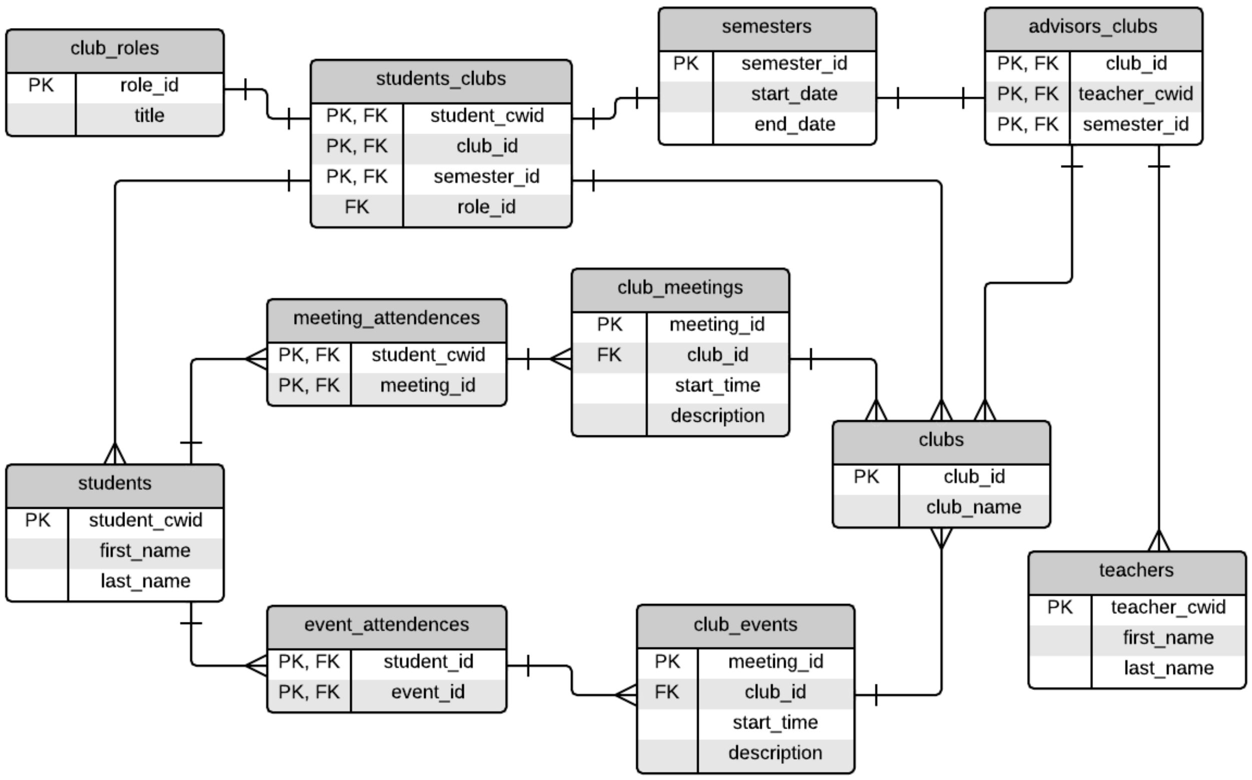
Executive Summary

The Marist College Club Management database keeps track of all the clubs at Marist College. It stores all the clubs, all of its members, officers, and advisors. The database also includes tables for storing club meetings and events, along with who attended. The database also includes stored procedures to retrieve information regarding how many priority points each member will receive.

ER Diagram


club_roles
PK role_id
title
students_clubs
PK, FK student_cwid
PK, FK club_id
PK, FK semester_id
FK role_id
semesters
PK semester_id
start_date
end_date
advisors_clubs
PK, FK club_id
PK, FK teacher_cwid
PK, FK semester_id
meeting_attendences
PK, FK student_cwid
PK, FK meeting_id
club_meetings
PK meeting_id
FK club_id
start_time
description
clubs
PK club_id
club_name
teachers
PK teacher_cwid
first_name
last_name
students
PK student_cwid
first_name
last_name
event_attendences
PK, FK student_id
PK, FK event_id
club_events
PK meeting_id
FK club_id
start_time
description

Students Table

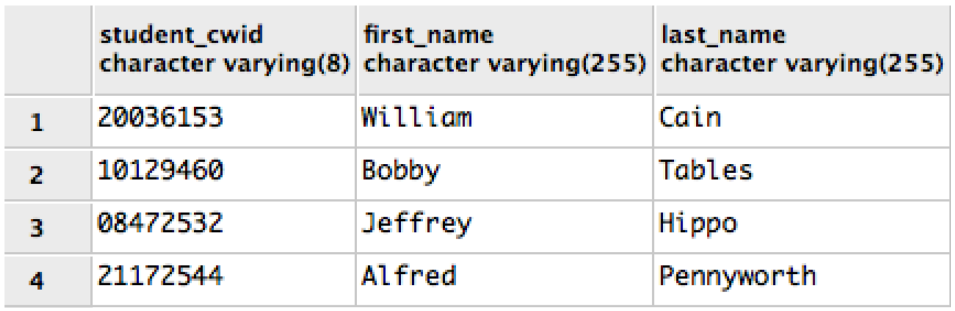
The student table stores all student information using the student's CWID to uniquely identify them.

```
CREATE TABLE students (
     student_cwid VARCHAR(8) PRIMARY KEY,
     first_name VARCHAR(255) NOT NULL,
     last_name VARCHAR(255) NOT NULL
);
```

Functional Dependencies

Student_cwid -> first_name
Student_cwid -> last_name

Sample Data



	student_cwid character varying(8)	first_name character varying(255)	last_name character varying(255)
1	20036153	William	Cain
2	10129460	Bobby	Tables
3	08472532	Jeffrey	Hippo
4	21172544	Alfred	Pennyworth

Teachers Table

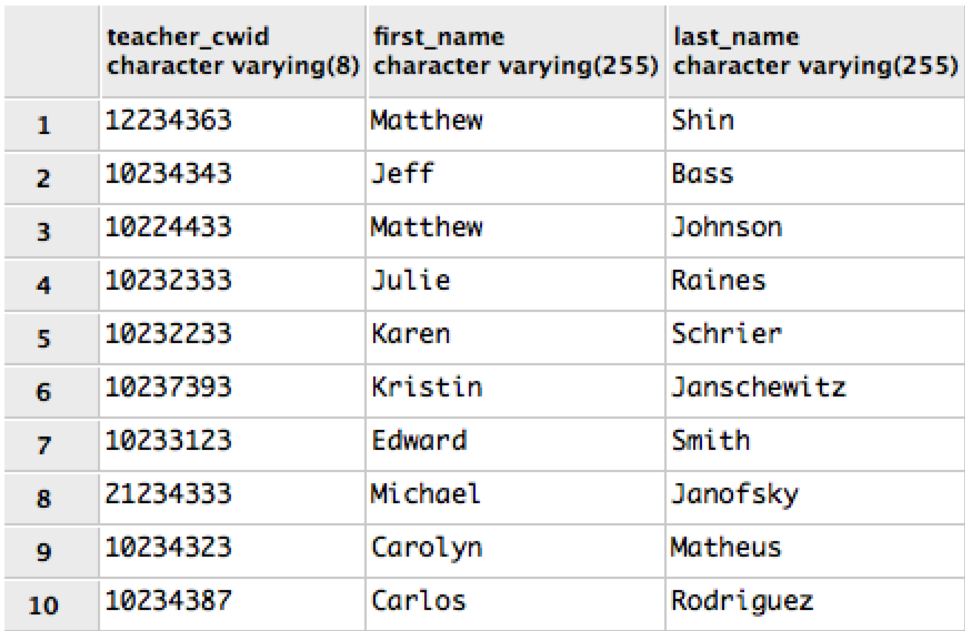
The student table stores all student information using the student's CWID to uniquely identify them.

```
CREATE TABLE teachers (
     teacher_cwid VARCHAR(8) NOT NULL PRIMARY KEY,
     first_name VARCHAR(255) NOT NULL,
     last_name VARCHAR(255) NOT NULL
);
```

Functional Dependencies

teacher_cwid -> first_name
teacher_cwid -> last_name

Sample Data



	teacher_cwid character varying(8)	first_name character varying(255)	last_name character varying(255)
1	12234363	Matthew	Shin
2	10234343	Jeff	Bass
3	10224433	Matthew	Johnson
4	10232333	Julie	Raines
5	10232233	Karen	Schrier
6	10237393	Kristin	Janschewitz
7	10233123	Edward	Smith
8	21234333	Michael	Janofsky
9	10234323	Carolyn	Matheus
10	10234387	Carlos	Rodriguez

Semesters Table

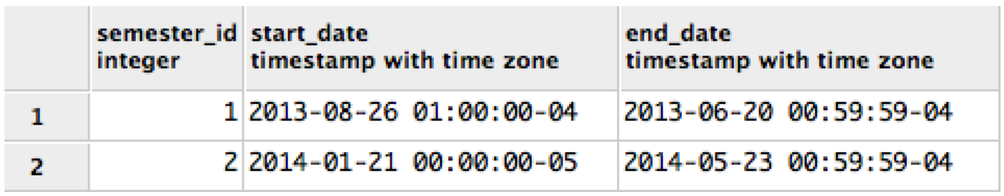
A semester is represented as a range of time with a start and end date. The semester is then identified using an automatically incremented index.

```
CREATE TABLE semesters (
        semester_id SERIAL NOT NULL PRIMARY KEY,
        start_date timestamp with time zone NOT NULL,
        end_date timestamp with time zone NOT NULL
);
```

Functional Dependencies

teacher_cwid -> first_name
teacher_cwid -> last_name

Sample Data



	semester_id integer	start_date timestamp with time zone	end_date timestamp with time zone
1	1	2013-08-26 01:00:00-04	2013-06-20 00:59:59-04
2	2	2014-01-21 00:00:00-05	2014-05-23 00:59:59-04

Club_Roles Table

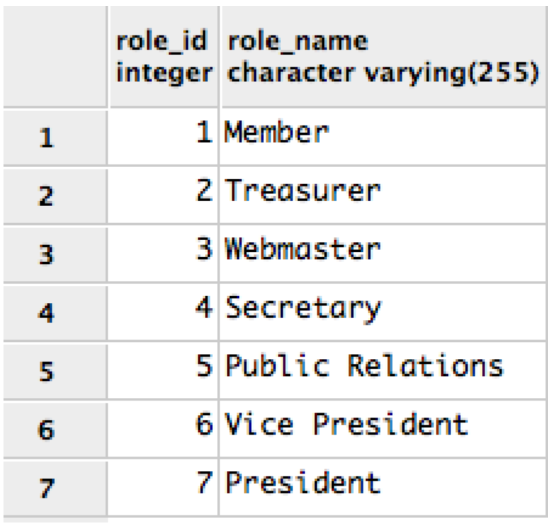
Within each club, a student can be either a general member or an officer. An officer typically has one of the following titles: President, Vice President, Treasurer, Webmaster, or Secretary. Typically, clubs follow this standard model; however, occasionally they have additional offices, such as public relations coordinator. Anyone who is not an officer is given the role of “member.”

```
CREATE TABLE club_roles (
	role_id SERIAL NOT NULL PRIMARY KEY,
	role_name VARCHAR(255) NOT NULL
);
```

Functional Dependencies

Role_id -> role_name

Sample Data



	role_id integer	role_name character varying(255)
1	1	Member
2	2	Treasurer
3	3	Webmaster
4	4	Secretary
5	5	Public Relations
6	6	Vice President
7	7	President

Clubs Table

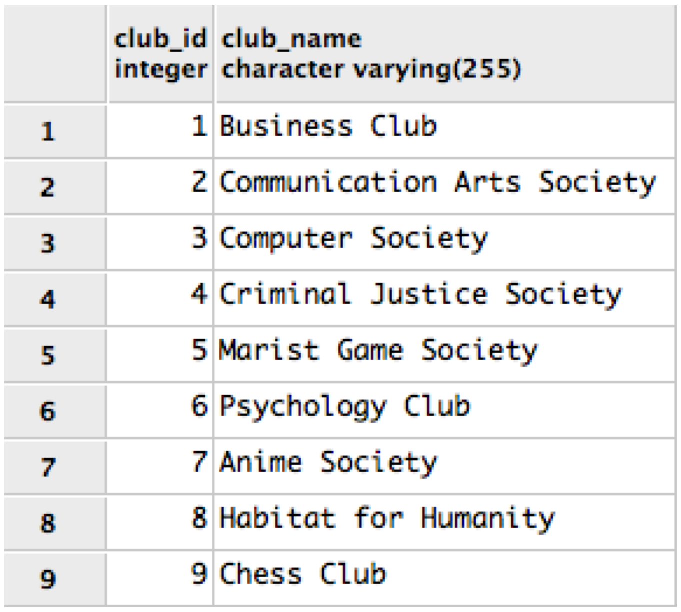
The club table is responsible for associating each club name with an automatically incremented integer to identify it.

```
CREATE TABLE clubs (
	club_id SERIAL NOT NULL PRIMARY KEY,
	club_name VARCHAR(255) NOT NULL
);
```

Functional Dependencies

Club_id -> club_name

Sample Data



	club_id integer	club_name character varying(255)
1	1	Business Club
2	2	Communication Arts Society
3	3	Computer Society
4	4	Criminal Justice Society
5	5	Marist Game Society
6	6	Psychology Club
7	7	Anime Society
8	8	Habitat for Humanity
9	9	Chess Club

Advisors_Clubs Table

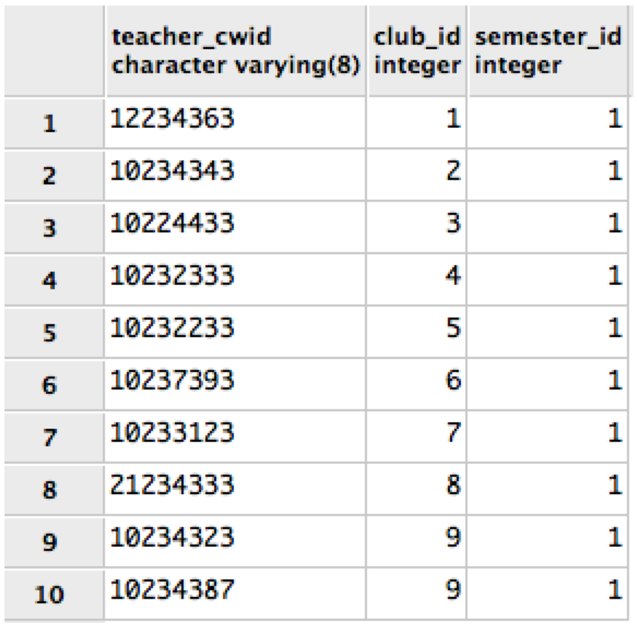
Advisors_Clubs is an associative table that tracks who each the club advisor is for a particular semester. Because primary key is a composite based off of the teacher's CWID, the club ID, and the semester, it supports clubs that have more than one advisor, such as the chess club.

```
CREATE TABLE advisors_clubs (
        teacher_cwid int REFERENCES teachers(teacher_id) NOT NULL,
        club_id int REFERENCES clubs(club_id) NOT NULL,
        semester_id int REFERENCES semesters(semester_id) NOT NULL,
        primary key (teacher_id, club_id, semester_id)
);
```

Functional Dependencies

N/A

Sample Data



	teacher_cwid character varying(8)	club_id integer	semester_id integer
1	12234363	1	1
2	10234343	2	1
3	10224433	3	1
4	10232333	4	1
5	10232233	5	1
6	10237393	6	1
7	10233123	7	1
8	21234333	8	1
9	10234323	9	1
10	10234387	9	1

Students_Clubs Table

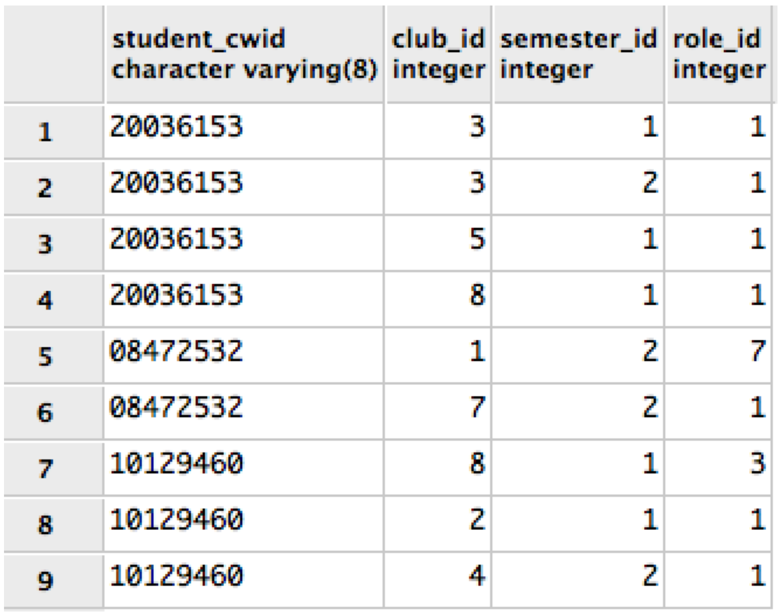
The students_clubs table is another associate table that tracks the members of each club for each semester along with what their role in the club was.

```
CREATE TABLE students_clubs (
        student_cwid VARCHAR(8) REFERENCES students(student_cwid) NOT
NULL,
        club_id int REFERENCES clubs(club_id) NOT NULL,
        semester_id int REFERENCES semesters(semester_id) NOT NULL,
        role_id int REFERENCES club_roles(role_id) NOT NULL,
        primary key (student_cwid, club_id, semester_id)
);
```

Functional Dependencies

N/A

Sample Data



	student_cwid character varying(8)	club_id integer	semester_id integer	role_id integer
1	20036153	3	1	1
2	20036153	3	2	1
3	20036153	5	1	1
4	20036153	8	1	1
5	08472532	1	2	7
6	08472532	7	2	1
7	10129460	8	1	3
8	10129460	2	1	1
9	10129460	4	2	1

Club_Meetings Table

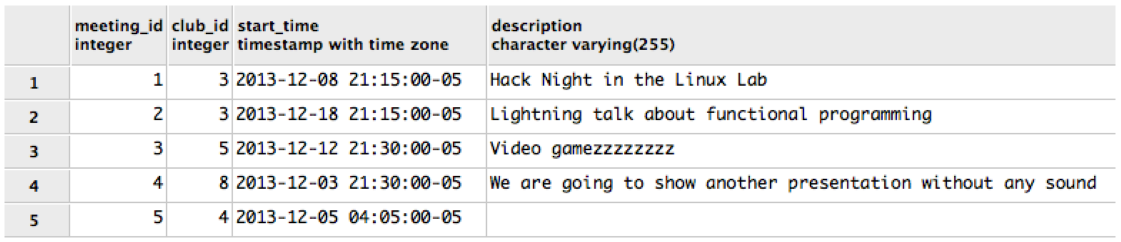
The club_meetings table stores a compilation of all the meetings for each club along with a start time. This table also includes an optional field for club officers to provide a description of what will be discussed at the meeting.

```
CREATE TABLE club_meetings (
	meeting_id SERIAL NOT NULL PRIMARY KEY,
	club_id int REFERENCES clubs(club_id) NOT NULL,
	start_time timestamp with time zone NOT NULL,
	description VARCHAR(255)
);
```

Functional Dependencies

meeting_id -> club_id
meeting_id -> start_time
meeting_id -> description

Sample Data



	meeting_id integer	club_id integer	start_time timestamp with time zone	description character varying(255)
1	1	3	2013-12-08 21:15:00-05	Hack Night in the Linux Lab
2	2	3	2013-12-18 21:15:00-05	Lightning talk about functional programming
3	3	5	2013-12-12 21:30:00-05	Video gamezzzzzzzz
4	4	8	2013-12-03 21:30:00-05	We are going to show another presentation without any sound
5	5	4	2013-12-05 04:05:00-05	

Club_Events Table

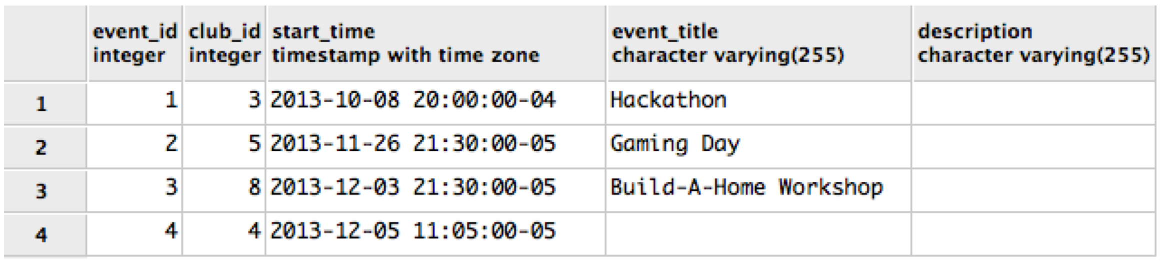
The club_events table stores a compilation of all the events for each club along with a start time. This table also includes an optional event title and description fields for club officers to provide more detail about the particular event.

```
CREATE TABLE club_events (
        event_id SERIAL NOT NULL PRIMARY KEY,
        club_id int REFERENCES clubs(club_id) NOT NULL,
        start_time timestamp with time zone NOT NULL,
        event_title VARCHAR(255),
        description VARCHAR(255)
);
```

Functional Dependencies

event_id -> club_id
event_id -> start_time
event_id -> event_title
event_id -> description

Sample Data



	event_id integer	club_id integer	start_time timestamp with time zone	event_title character varying(255)	description character varying(255)
1	1	3	2013-10-08 20:00:00-04	Hackathon	
2	2	5	2013-11-26 21:30:00-05	Gaming Day	
3	3	8	2013-12-03 21:30:00-05	Build-A-Home Workshop	
4	4	4	2013-12-05 11:05:00-05		

Meeting_Attendances Table

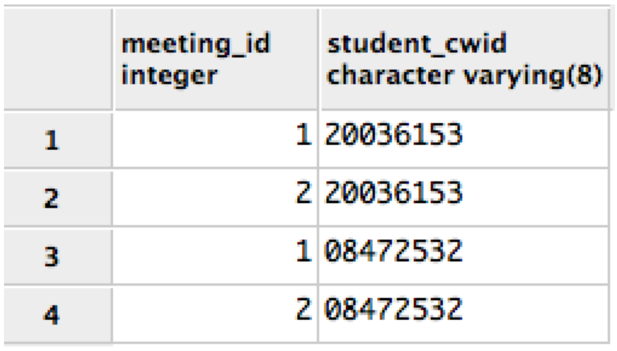
Description: The meeting_attendances table is an associative table that tracks what members attended each club meeting.

```
CREATE TABLE meeting_attendances (
	meeting_id int REFERENCES club_meetings(meeting_id) NOT NULL,
	student_cwid VARCHAR(8) REFERENCES students(student_cwid) NOT
NULL,
	primary key (meeting_id, student_cwid)
);
```

Functional Dependencies

N/A

Sample Data



	meeting_id integer	student_cwid character varying(8)
1	1	20036153
2	2	20036153
3	1	08472532
4	2	08472532

Event_Attendances Table

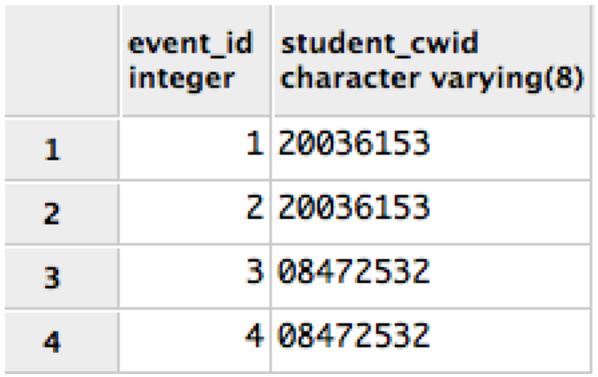
The event_attendances table is an associative table that tracks what members attended each club event.

```
CREATE TABLE event_attendances (
	event_id int REFERENCES club_events(event_id) NOT NULL,
	student_cwid VARCHAR(8) REFERENCES students(student_cwid) NOT
NULL,
	primary key (event_id, student_cwid)
);
```

Functional Dependencies

N/A

Sample Data



	event_id integer	student_cwid character varying(8)
1	1	20036153
2	2	20036153
3	3	08472532
4	4	08472532

Views

This view returns a list of all the clubs that are currently in affect this semester. It calculates the current semester using the current timestamp.

```
DROP VIEW IF EXISTS ClubsThisSemester;
CREATE VIEW ClubsThisSemester AS
SELECT distinct club_name
FROM clubs c, students_clubs sc, semesters sem
WHERE c.club_id = sc.club_id
AND sc.semester_id = sem.semester_id
AND NOW() > sem.start_date
AND NOW() < sem.end_date;
```

Queries

This query returns a list of all the students in Computer Society, along with what role each student plays in the club.

```
SELECT first_name, last_name, role_name
FROM students s, clubs c, students_clubs sc, club_roles cr,
semesters sem
WHERE club_name = 'Computer Society'
AND s.student_cwid = sc.student_cwid
AND c.club_id = sc.club_id
AND cr.role_id = sc.role_id
AND sc.semester_id = sem.semester_id
AND NOW() > sem.start_date
AND NOW() < sem.end_date;
```

Stored Procedures

Returns the number of meetings a student attended for a particular club during a particular semester.

```
CREATE FUNCTION studentForMeetings(clubId int, semId int, cwid text)
RETURNS BIGINT as $$
      SELECT count(cm.meeting_id) as attendances
      FROM club_meetings cm, meeting_attendances ma, semesters sem
      WHERE cm.club_id = $1
      AND cm.start_time >= sem.start_date
      AND cm.start_time <= sem.end_date
      AND sem.semester_id = $2
      AND ma.student_cwid = $3
      AND cm.meeting_id = ma.meeting_id;
$$ language 'sql';

SELECT * FROM studentForMeetings(3, 1, '20036153');
```

Stored Procedures

Returns the number of events a student attended for a particular club during a particular semester.

```
CREATE FUNCTION studentForEvents(eventId int, semId int, cwid text)
RETURNS BIGINT as $$
      SELECT count(ce.event_id) as attendances
      FROM club_events ce, event_attendances ea, semesters sem
      WHERE ce.club_id = $1
      AND ce.start_time >= sem.start_date
      AND ce.start_time <= sem.end_date
      AND sem.semester_id = $2
      AND ea.student_cwid = $3
      AND ce.event_id = ea.event_id;
$$ language 'sql';

SELECT * FROM studentForEvents(3, 1, '20036153');
```

Stored Procedures

Returned the total number of meetings a club held during a particular semester.

```
CREATE FUNCTION totalMeetingsBySemester(clubId int, semId int)
RETURNS BIGINT as $$
      SELECT count(meeting_id) as attendances
      FROM club_meetings ce, semesters sem
      WHERE cm.club_id = $1
      AND cm.start_time >= sem.start_date
      AND cm.start_time <= sem.end_date
      AND sem.semester_id = $2;
$$ language 'sql';

SELECT * FROM totalMeetingsBySemester(3, 1);
```

Stored Procedures

Returned the total number of events a club held during a particular semester.

```
CREATE FUNCTION totalEventsBySemester(eventId int, semId int)
RETURNS BIGINT as $$
      SELECT count(event_id) as attendances
      FROM club_events ce, semesters sem
      WHERE ce.club_id = $1
      AND ce.start_time >= sem.start_date
      AND ce.start_time <= sem.end_date
      AND sem.semester_id = $2;
$$ language 'sql';

SELECT * FROM totalEventsBySemester(3, 1);
```

Stored Procedures

Returned a Boolean whether a particular student earned 3 priority points for a particular semester from the given club.

```
DROP FUNCTION IF EXISTS threePriorityPoints(int, int, text);

CREATE FUNCTION threePriorityPoints(semId int, clubId int, cwid
text)
RETURNS BOOLEAN as $$
      SELECT (role_id <> 1
            AND 100 * studentForMeetings(sc.club_id, sc.semester_id,
sc.student_cwid) / totalMeetingsBySemester(sc.club_id,
sc.semester_id) >= 50
            AND studentForMeetings(sc.club_id, sc.semester_id,
sc.student_cwid) = totalMeetingsBySemester(sc.club_id,
sc.semester_id))
      FROM students_clubs sc, semesters sem
      WHERE sc.semester_id = $1
      AND sc.club_id = $2
      AND sc.student_cwid = $3;
$$ language 'sql';

SELECT * FROM threePriorityPoints(1, 3, '20036153');
```

Stored Procedures

Returned a Boolean whether a particular student earned 2 priority points for a particular semester from the given club.

```
DROP FUNCTION IF EXISTS twoPriorityPoints(int, int, text);
CREATE FUNCTION twoPriorityPoints(semId int, clubId int, cwid text)
RETURNS BOOLEAN as $$
      SELECT (100 * studentForMeetings(sc.club_id, sc.semester_id,
sc.student_cwid) / totalMeetingsBySemester(sc.club_id,
sc.semester_id) >= 50
            AND 100 * studentForMeetings(sc.club_id, sc.semester_id,
sc.student_cwid) / totalMeetingsBySemester(sc.club_id,
sc.semester_id) >= 75)
      FROM students_clubs sc, semesters sem
      WHERE sc.semester_id = $1
      AND sc.club_id = $2
      AND sc.student_cwid = $3;
$$ language 'sql';
SELECT * FROM twoPriorityPoints(1, 3, '20036153');
```

Stored Procedures

Returned a Boolean whether a particular student earned 1 priority point for a particular semester from the given club.

```
DROP FUNCTION IF EXISTS onePriorityPoint(int, int, text);
CREATE FUNCTION onePriorityPoint(semId int, clubId int, cwid text)
RETURNS BOOLEAN as $$
     SELECT (100 * studentForMeetings(sc.club_id, sc.semester_id,
sc.student_cwid) / totalMeetingsBySemester(sc.club_id,
sc.semester_id) >= 50
          AND 100 * studentForMeetings(sc.club_id, sc.semester_id,
sc.student_cwid) / totalMeetingsBySemester(sc.club_id,
sc.semester_id) >= 50)
     FROM students_clubs sc, semesters sem
     WHERE sc.semester_id = $1
     AND sc.club_id = $2
     AND sc.student_cwid = $3;
$$ language 'sql';
SELECT * FROM onePriorityPoint(1, 3, '20036153');
```

Implementation Notes

The Club Management database consists of 11 interconnected tables. For the system to function properly, the tables must be created in the order that they appear within this document.

Known Issues

In the functions that calculate priority points, the `twoPriorityPoints` will return true even if the student earned 3 priority points. Additionally, the `onePriorityPoint` will return true if the student earned one <u>or more</u> priority points.

According to the revised club rules, club sports cannot give more than 5 priority points per year. This means that captains only earn 2 priority points during the offseason instead of 3.

Future Enhancements

In order to properly calculate the number of priority points, the database should be extended to include a Community Service table with an accompanying CommunityService_Attendances associative table. The new priority point guidelines require each club to include this.