PARKS AND RECREATION PROBLEM

IST210 Project

Problem Instructions

As a team and aided by case materials, course content, and quality external resources, you need to create a document and presentation to meet the requirements outlined by the Bureau of Parks and Recreation.

Problem Introduction

The Bureau of Parks and Recreation currently offers courses to the public dealing with various nature-oriented topics, such as wildlife refuges, water conservancy, animal habitats, and much more. To register for one of these courses, a person must either mail in a registration form, register by phone, or register in person at a Parks and Recreation location. The Bureau has a fully functional website, and is planning to have online registration in the future. The first step toward that is implementing a database structure that adheres to the Bureau's interoperability standards.

The Bureau of Parks and Recreation would like to use a database management system (DBMS) to organize, store, and retrieve data concerning class registrations. Major benefits of using a DBMS are the data security and integrity controls, the ease of information manipulation with Structured Query Language (SQL), and the ability to interface with other systems within the Bureau. The Bureau has an existing database design, which provides a foundation for interoperability. Adhering to the table schemas allows other systems and programs to interact with the database. In general, the proposed DBMS capability is an initial step to an interactive class registration system, which allows entering and tracking students and course management. In this project, the SQL is developed to implement the integrity constraints and queries. The SQL will allow students to register for courses as well as for staff personnel to maintain up to date course and student information.

The Bureau would like a system that enforces referential integrity and enterprise constraints and performs maintenance operations, queries, and views based on the system requirements outlined in this document.

The system the Bureau desires will enhance services provided by the Bureau of Parks and Recreation. Students and instructors will be able to quickly find relevant information concerning course information, registration, contact information, etc. The database system will supplement current enrollment methods (phone, mail, in person) but does not replace them. Specific benefits of the system include:

- Improving student registration by efficiently gathering and applying appropriate integrity checks to the information.
- Helping instructors by eliminating the time required to manually manage class registrations.
- Serving potential students when and where they want to be served by being available 24 hours per day, seven days per week on the Internet.

For a more detailed walkthrough of what the Bureau foresees, check out the User Scenario, located in the Resources section of this document.
The Parks and Recreation Problem is a team effort to implement a given database design. Based upon the Bureau of Parks and Recreation’s Entity-Relationship Diagram, data definitions, and query and view requirements, your team will implement referential integrity and assign database access privileges enforcing the business rules laid out by the Bureau. You will also need to implement queries and views meeting criteria set forth by the Bureau. The Bureau has asked your team to document your processes for completing all the tasks listed, and to discuss potential backup and recovery plans, as well as any legal issues the bureau may face with the new registration system.

Each member of your team will have a specific role throughout this project. It is your team’s responsibility to ensure that each member participates equally throughout the design and development of the products.

This document will provide general system information about the database definition, business rules, and the desired database queries. The general system information gives you the circumstances about the system and how it will operate. The database description will provide a listing of the database tables and the associated fields and attributes. You are required to use the provided table schemas (more directions in the Resources section of this document). The provided business rules listed later in this document contain information about the integrity constraints to be implemented. The query statements provided later in this document provide a guide for the SQL you will prepare to manipulate and retrieve information from the database.

It is the responsibility of your team to demonstrate the nature of the solution by producing two products: a problem document and a problem presentation. Requirements for each of these products are detailed throughout this document.

One of your team’s responsibilities is to ensure that each of your team members participate equally throughout the design and development of the products. It is highly recommended that, prior to starting the project, each member of your team choose a role from which you will play throughout the project. Choose the participants that you feel will most strongly make your case to the management of the Bureau of Parks and Recreation.

- Project Manager
- Database Administrator
- Data Analyst
- Quality Assurance
- Programmer

**Problem Objectives**

After completing this problem, you should be able to:

- Deliver a document covering the requirements of the project
- Discuss your team’s understanding of the scope of work for the project
- Summarize the various features of the project
- Develop a plan for completing the project
- Identify the resources that will be needed to complete the project
- Identify the administrative and staff needs for using the system
- Analyze the provided tables and implement the correct relationships
- Outline data backup and recovery strategies
- Develop appropriate queries to satisfy end-user needs
- Design appropriate queries to generate reports

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• Address privacy issues dealing with storing and using people’s private information
• Implement the integrity constraints provided within the document
Problem Assignment

Scope of Project

Based upon the Bureau of Parks and Recreation’s Entity-Relationship Diagram, data definitions, and query and view requirements, your team will create and implement referential integrity and assign database access privileges enforcing the business rules. You will implement queries and views that fulfill the requirements set forth by the Bureau. Also within the documentation, discuss backup and recovery concerns and identify legal issues that the Bureau of Parks and Recreation needs to be aware of.

It is the intent of the management of the Bureau of Parks and Recreations to solicit proposals for this project. The management has solicited your project team to submit a plan to implement the constraints to the current database design. Within this proposal, you should document the steps you followed to implement the current Entity-Relationship Diagram, data definitions, and query and view requirements provided by the Bureau of Parks and Recreation. Your team will also need to implement referential integrity constraints, assign database access privileges enforcing the business rules, and implement queries and views that provide relevant information. In addition to this, you will need to discuss backup and recovery issues the Bureau faces, as well as any legal issues that may arise by utilizing the registration system.

NOTE: It is not necessary to actually create the web interface that would be used as the front end of the registration system. The required portion of this project focuses on the design and implementation of the database. The second phase would be to create the website. If you would like extra credit, you may go ahead and create the website for the registration system. PLEASE CONSULT WITH YOUR INSTRUCTOR BEFORE CONSTRUCTING THE SITE; SOME INSTRUCTORS MAY OR MAY NOT GRANT EXTRA CREDIT. More details concerning this can be found in the Resources section of this document.

Upon completion of the proposal, your team should submit one copy of the document to your instructor. You will also be required to develop a 10-20 minute presentation, to be given to the management of the Bureau of Parks and Recreation.

Problem Document

As part of the project, your team is required to create a project document. This document will be used to demonstrate your understanding and the scope of the project and your suggested solution. The document should be no longer than 25 single spaced pages, and must include at a minimum the following components:

I. Document Cover (1 Page)

As part of the submission procedures for this proposal, you are required to prepare a document cover. The cover needs to include the following:

1. Proposal Title
2. Class Section
3. Instructor Name
4. Company Name, Address, and Telephone Number
5. Date of Submission
6. Any other Relevant Data

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II. Table of Contents (1 page)
Create a document table of contents that outlines the major document headings and subheadings.

III. Executive Summary (1 page)
Create a one-page summary of your plan which is brief, to the point, and will hopefully evoke sufficient interest in the recipient to warrant taking a closer look. It is used to summarize the major parts of the document and entice the reader to continue reading the rest of the document.

IV. Project Overview (2-4 pages)
Scope of Work
Discuss your understanding of Bureau’s needs for the new system in relation to what your team is required to do.

V. Project Management (2-4 pages)
Project Plan
Provide a proposed plan for completing the project that includes, at a minimum, the following information:
- An in-depth explanation of what it will take to complete the project
- Proposed project timeline, that includes a start and an end date for the entire project, as well as deliverables (preferably in a Gantt chart)
- Project deliverables
- Major milestones

Project Resources
Identify the resources you feel will be needed to complete the proposed project. You should focus on identifying the following:
- The personnel needed to be able to complete the project, their job titles, and the total amount of time they will need to spend on the project.
- A description of the roles and responsibilities for each of the identified personnel.

VI. Organization of Data and Data Implementation (2-3 pages)
Implementation
Make sure you are using the provided table schema, given by the Bureau of Parks and Recreation. Consult the Resources section of this document to find the schema.

Review database Normalization
Review the tables provided by the Bureau of Parks and Recreation to ensure they are in the 3rd Normal Form. Document and explain why, or why not, the tables are in the 3rd Normal Form. DO NOT manipulate the tables, just document your findings. The Bureau has specifically designed these tables to fit into their interoperability standards.

VII. Implement Referential Integrity and Constraints (2-3 pages)
The following are business rules for the database system, which is a type of constraint. A business rule is a statement that defines or constrains some aspect of the operation. It asserts structure, control, or influence over the behavior of the data stored or being entered into the database. Implement the following business rules within a database system by using such techniques as referential constraints (assigning primary and foreign keys) and check constraints. The business rules relating to this system are:
1. **A COURSE may consist of one or more CLASSes**
2. An INSTRUCTOR may teach one or more CLASSes
3. A STUDENT may enroll in many CLASSes
4. A STUDENT can take more than one CLASS, and each CLASS contains many STUDENTS
5. A CLASS is taught by only one INSTRUCTOR, but an INSTRUCTOR can teach many CLASSes
6. A COURSE consists many CLASSes, while each CLASS is based on one COURSE, so there is a one-to-many relationship between COURSE and CLASS
7. A STUDENT may not enroll himself/herself for two CLASSes of the same course
8. An INSTRUCTOR may not teach two CLASSes of the same COURSE
9. The date in the CLASS table must be equal or greater than August, 2002
10. The time in the CLASS table must be between 8:00 a.m. and 3p.m.

VIII. Database Updates and Reports (1-2 pages)
The Bureau of Parks and Recreation has requested that you provide the SQL necessary to complete the tasks listed below. Create the appropriate SQL that will be needed to query, retrieve, or update the specific information the Parks and Recreation staff desires. Use existing data stored in the database for examples in your code when needed. Note, some items below may take more than one string of SQL code, due to several tables being affected by the statement.
1. For students to enroll in a class.
2. For instructors to add course and class information.
3. For a student to search the database for course titles, course sections, class times, dates, and instructors.
4. List all courses that have more than 10 students enrolled.
5. For the student to query the database to see what classes he/she is registered for. List course ID, class section, date and time.
6. For the instructor to query the database for what student names are registered for his/her class.
7. Instructor to query the database for information for course name, class section, instructors, dates, and number of students.

IX. Database Administration (1-2 pages)
Database Backup and Recovery
Highlight and briefly elaborate upon issues the Bureau of Parks and Recreation should address concerning data backup and recovery strategies. Discuss how you will deal with technical issues that may occur while using the site.
Data Security
Highlight and briefly elaborate on what types of measures need to be in place so the system cannot be breached. Include how you will secure the database so only people with the correct login/password will be able to access the data. Identify which users should be granted specific privileges and views into the database, and for what reasons.

X. Legal Issues (1–2 pages)
Determine any disclaimers or privacy statements that need to be stated within this document and also located somewhere within the website for the customers to view. Some items that should be included are:
- Privacy Statement – Identify the type of information that needs to be discussed in a privacy statement. Also, address how you plan on keeping the
customer’s data private, how the customer’s data will be used, and what security is in place to maintain the data remains private.

- Terms and Conditions for Use – create a registration policy that will include terms for refunding, missing a class due to an emergency, etc... also identify the ramifications of violating the terms and conditions.

**List of References (Page count is whatever is appropriate)**
Your team must compile a list of references that were used to help create your proposal document. This list of references should follow either the MLA or APA format. This section should not be considered part of the overall page count for the document.

**Problem Presentation**
Your team is required to present your solution to the management of the Bureau of Parks and Recreation. This presentation will be used for you to demonstrate your understanding of the problem and present your solution to the management. The management reserves the right to give you strings of code to run on your database to ensure you have implemented your constraints correctly. This is your opportunity for your team to demonstrate that your company is the best company to do the job and to sell your solution. Each of your team members will, equally, need to demonstrate their understanding of the project by participating in the presentation process. The presentation should be no longer than 10-20 minutes.

Your presentation should include the following:
- A team introduction
- A brief description of your understanding of the scope of work
- Project timeline along with major milestones
- A discussion of the steps you followed to implement the database and assign keys
- Walk through at least 2 examples of how you implemented referential integrity and the business rules
- Walk through at least 2 queries from the database reports section
- Discuss your strategies for database backup and recovery, as well as data security
- Identify any legal issues you encountered, and what your proposed solution for dealing with these legal issues is
- Conclusions
Problem Resources
Tables provided by the Bureau

User Scenario
During a walk home, a user notices a "Public Notice" sign. The user reads the sign to see what is going on, and notes that there is a web address for more information concerning a Centre Region Parks and Recreation class at the Millbrook Marsh Nature Center titled “Wetland Critters.” When the user gets home, they visit the Parks and Recreation site and find the following information:

"A course that focuses on the animals that make their homes in marshes and wetlands. Learn about the animals and their habitats while exploring the marsh, understand their life cycles, explore the importance of food chains, and much more!! The course is 1.5 to 2 hours in length. Please note: Live, captive animals will not be used during this program. The cost is $3.50 per person that will be collected at the start of the class. Register on-line or by visiting the Bureau of Parks and Recreation Offices”

The site contains a database-driven Parks & Recreation Program Guide that shows all of the courses offered, including whether or not the course is full, and allow on-line registration. Each course offering may consist of up to two classes that are taught simultaneously by different instructors. When the individual wants to register for a class, they click on the link. In addition to all kinds of information about the class, there is a simple on-line registration form. They submit their registration application on-line, and are taken to a web page that shows the registration, which is printed. The user saves time and a trip to the Parks and Recreation Office to register.
Entity-Relationship Diagram

Instructor

1/M

Teaches

M/1

Class

0/M

Associated with

1

Course

Student

1/M

Enrolls In

M/1
Database Design

The following database design is provided and must be utilized in the development of your SQL. The names of the tables and a brief description of each table within the class registration system database are provided. A detailed list of the attributes that make up each table is described later in this section.

### Database Tables

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>A record of the student information including an identification number, name, class affiliation (section 1 or 2), password, email address, phone number, and address.</td>
</tr>
<tr>
<td>Instructor</td>
<td>A record of class instructors and their information including identification number, name, class affiliation (section 1 or 2), password, email address, phone number, and address.</td>
</tr>
<tr>
<td>Course</td>
<td>A record of the course information including a unique course identification number, course name, number of classes (sections), and description.</td>
</tr>
<tr>
<td>Class</td>
<td>A record of class information including the course number, class section number, number of students in the class, date of the class, and time of the class.</td>
</tr>
<tr>
<td>Student-Class</td>
<td>An associative entity that inherits its primary key from the student and class tables.</td>
</tr>
<tr>
<td>Instructor-Class</td>
<td>An associative entity that inherits its primary key from the instructor and class tables.</td>
</tr>
</tbody>
</table>

The following gives a detailed description of the attributes in each table.

<table>
<thead>
<tr>
<th>Field</th>
<th>Domain</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student_Id</td>
<td>Integer</td>
<td></td>
</tr>
<tr>
<td>Student_Name</td>
<td>varchar</td>
<td>25</td>
</tr>
<tr>
<td>Student_Affiliation</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Student_Passwd</td>
<td>varchar</td>
<td>20</td>
</tr>
<tr>
<td>Student_Email</td>
<td>varchar</td>
<td>30</td>
</tr>
<tr>
<td>Student_Phone</td>
<td>varchar</td>
<td>12</td>
</tr>
<tr>
<td>Student_Address</td>
<td>varchar</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Domain</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor_Id</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Instructor_Name</td>
<td>varchar</td>
<td>25</td>
</tr>
<tr>
<td>Instructor_Affiliation</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Instructor_Passwd</td>
<td>varchar</td>
<td>20</td>
</tr>
<tr>
<td>Instructor_Email</td>
<td>varchar</td>
<td>30</td>
</tr>
<tr>
<td>Instructor_Phone</td>
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<td>12</td>
</tr>
<tr>
<td>Instructor_Address</td>
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</tr>
<tr>
<td>Field</td>
<td>Domain</td>
<td>Width</td>
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<tr>
<td>-----------------------</td>
<td>------------</td>
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</tr>
<tr>
<td>Course_Id</td>
<td>integer</td>
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</tr>
<tr>
<td>Course_Name</td>
<td>varchar</td>
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</tr>
<tr>
<td>Course_Sections</td>
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<td></td>
</tr>
<tr>
<td>Course_Description</td>
<td>varchar</td>
<td>50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Domain</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course_Id</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Class_Section</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Class_Strength</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Class_Date</td>
<td>date</td>
<td></td>
</tr>
<tr>
<td>Class_Time</td>
<td>time</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>Domain</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course_Id</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Class_Section</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Student_Id</td>
<td>integer</td>
<td></td>
</tr>
</tbody>
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<tr>
<td>Class_Section</td>
<td>integer</td>
<td></td>
</tr>
<tr>
<td>Instructor_Id</td>
<td>integer</td>
<td></td>
</tr>
</tbody>
</table>
# Bureau of Parks and Recreation Problem Rubric

**Bureau of Parks and Recreation Document Rubric**

**Student Name:**

**Date:**

**Directions:** Give each team a score out of the possible points for each major Topic area. Portions of a point may be given. Total the score at the end and provide feedback.

<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Description of Achievement</th>
<th>Possible Points</th>
<th>Points Scored</th>
</tr>
</thead>
</table>
| 1. Document Organization            | • Document greatly enhanced the effectiveness of the project.  
  • Extremely well organized and easy to follow.  
  • Document contained; cover page, table of contents, and executive summary.  
  • Included all document sections as listed in proposal document.  
  • Provided a list of references used following MLA format.  
  • Integrated all relevant course and case materials.  
  • Exemplary mechanics with very few, if any, grammatical or spelling errors.                                                                                                      | 5               |               |
| 2. Content Accuracy: Project Overview | • Discussed the needs of the Bureau and your team’s role in fulfilling that need.                                                                                                                                           | 5               |               |
| 3. Content Accuracy: Project Management | • Provided a plan for the completion of the project.  
  • Identified the project resources needed to complete the project along with roles and responsibilities.                                                                                 | 10              |               |
| 4. Content Accuracy: User Analysis  | • Identified and described the audience who will be using the system.  
  • Discussed the various user views into the database and discussed how access privileges should be set.                                                                                                             | 15              |               |
| 5. Content Accuracy: Organization of Data | • Documented and explained the SQL used to establish referential integrity.  
  • Documented and explained the SQL used to create various database reports.                                                                                                                               | 40              |               |
<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Description of Achievement</th>
<th>Possible Points</th>
<th>Points Scored</th>
</tr>
</thead>
</table>
| 6. Content Accuracy: Database Administration | • Discussed strategies that would ensure the system would run at the highest level of performance and security.  
                                        | • Documented backup and recovery concerns, and suggested strategies to deal with these concerns. | 15              |               |
| 7. Content Accuracy: Legal Issues | • Documented issues that need to be covered in a privacy statement.  
                                        | • Created a privacy statement that would go on the website.  
                                        | • Created a policy that deals with the terms and condition of use for individuals utilizing the system. | 5               |               |
| 8. Research and Creativity        | • Went “above and beyond” to research relevant, internal and external information.  
                                        | • Utilized course material, case material, and quality external resources that truly enhanced the project.  
                                        | • Extremely clever solution.  
                                        | • Document presented in a unique and creative way that truly enhanced the project. | 5               |               |
| **TOTAL POINTS**                  |                                                                                           |                 | **100**       |

Things that stood out about this document:

Comments:
# Bureau of Parks and Recreation Presentation Rubric

**Student Name:**

**Date:**

**Directions:** Give each team a score out of the possible points for each major Topic area. Portions of a point may be given. Total the score at the end and provide feedback.

<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Description of Achievement</th>
<th>Possible Points</th>
<th>Points Scored</th>
</tr>
</thead>
</table>
| 1. Design and Creativity | • Presentation highlights the most important features of the solution.  
• A great deal of case, course, and external research material is used to justify the proposed solution.  
• Very original presentation of the material.  
• Uses the unexpected to full advantage. | 10              |               |
| 2. Presentation Content | • Introduce each team member.  
• Provided a brief description of your understanding of the scope of work.  
• Presented a project timeline along with resources needed and major milestones.  
• Demonstrated referential integrity and enterprise constraints.  
  Walked through at least 2 examples and explain.  
• Demonstrated queries to build reports.  Walked through at least 2 examples and explain.  
• Discussed the legal issues facing the Bureau with implementing the new system.  
• Discussed security issues the Bureau may face, and suggested solutions. | 20              |               |
| 3. Audience Response/Sales Tactics and the Decision | • The Bureau of Parks and Recreation is very pleased and excited about your solution!  
• Presenters field Bureau, audience, and instructor questions very successfully—the Board feels confident in what you are presenting to them.  
• Held the audience's attention throughout. | 10              |               |
| 4. Speaking Skills and Organization | • Poised with clear articulation.  
• All team members speak during the presentation.  
• All team members participate at a | 10              |               |
<table>
<thead>
<tr>
<th>Topic Area</th>
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<th>Possible Points</th>
<th>Points Scored</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>very high and balanced level.</td>
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<tr>
<td></td>
<td>• Good posture, volume, and eye contact.</td>
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<tr>
<td></td>
<td>• Enthusiasm and confidence are exuded.</td>
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<tr>
<td></td>
<td>• Presentation fits into the recommended time allotment.</td>
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<td></td>
<td>• Purpose of the presentation is very evident.</td>
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<tr>
<td></td>
<td>• Conclusion is very clear.</td>
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<tr>
<td></td>
<td>• Flows together very well.</td>
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</tr>
<tr>
<td></td>
<td>• Great transitions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL POINTS</td>
<td></td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

Things that stood out about this presentation:

Comments: