NUNStA Online Book Exchange

Students at the National University of Ngendipura (NUN) buy books for their studies. They also lend and borrow books from other students. Your company, Apasaja Pt. Ltd., is commissioned by NUN Students Association (NUNStA) to design and implement an online book exchange system for its students.

Apasaja Pt. Ltd. designs and implements a database application that records information about students, books they own and books they borrow from other students.

The database records the name, faculty, department and student number of each student. Each student is identified in the system by its email. The database also records the date at which the student joined the university.

The database records the title, authors, publisher, year and edition and the ISBN-10 and ISBN-13 for each book. The International Standard Book Number, ISBN-10 or -13, is an industry standard for the unique identification of books. It is possible that the database records books that are not owned by any students (because the owners of a copy graduated or because the book was advised by a lecturer for a course but not yet purchased by any student.)

The database records the date at which a book copy is borrowed and the date at which it is returned. We will refer to this information as a loan record.

For historical purposes the database records information about the copies and the owners of copies as long as the owners are students or there are loan records concerning the copies.

For historical purposes the database records information about graduated students as long as there are loan records concerning books that they owned.

For historical purposes (in order to keep the loan records for this book) the database records the case of a book that was owned and subsequently sold unless the copy was never borrowed.

CREATE TABLE book (

title VARCHAR(256) NOT NULL,

format CHAR(9) CHECK(format = 'paperback' OR format='hardcover'),

pages INT,

language VARCHAR(32),

authors VARCHAR(256),

publisher VARCHAR(64),

year DATE,

ISBN10 CHAR(10) NOT NULL UNIQUE,

ISBN13 CHAR(14) PRIMARY KEY

)

CREATE TABLE student (

name VARCHAR(32) NOT NULL,

email VARCHAR(256) PRIMARY KEY,

year DATE NOT NULL,

faculty VARCHAR(62) NOT NULL,

department VARCHAR(32) NOT NULL,

graduate DATE,

CHECK(graduate >= year)

)

CREATE TABLE copy (

owner VARCHAR(256) REFERENCES student(email) ON UPDATE CASCADE ON DELETE CASCADE,

book CHAR(14) REFERENCES book(ISBN13) ON UPDATE CASCADE,

copy INT CHECK(copy>0),

available BIT NOT NULL DEFAULT 'TRUE',

PRIMARY KEY (owner, book, copy)

)

CREATE TABLE loan (

borrower VARCHAR(256) REFERENCES student(email),

owner VARCHAR(256)

book CHAR(14),

copy INT,

borrowed DATE,

returned DATE,

FOREIGN KEY (owner, book, copy) REFERENCES copy(owner, book, copy) ON UPDATE CASCADE ON DELETE CASCADE,

PRIMARY KEY (borrowed, borrower, owner, book, copy),

CHECK(returned >= borrowed)

)

Tutorial 1

1. Create the table that contains the following information about books: title, format (paperback or hardcover), number of pages, authors, publisher, year, edition, ISBN-10 and -13. Check out one book on the Web, for instance on amazon.com, to see some examples of the values of these attributes. Check out the Web for the available SQL domains (types) and try them with your database management system. Choose a primary key. Forbid NULL values.

CREATE TABLE book (

title VARCHAR(128) NOT NULL,

format CHAR(9) CHECK(format = ‘paperback’ OR format=’hardcover’ OR format IS NULL),

pages INT,

authors VARCHAR(128),

publisher VARCHAR(32),

year DATE,

ISBN10 CHAR(10) NOT NULL UNIQUE,

ISBN13 CHAR(14) PRIMARY KEY,

)

1. Print all the information about books.

SELECT \* FROM book

1. Delete the relation book.

DROP TABLE book

1. Re-create the table books.

CREATE TABLE book (

title VARCHAR(128) NOT NULL,

format CHAR(9) CHECK(format = ‘paperback’ OR format=’hardcover’ OR format IS NULL),

pages INT,

authors VARCHAR(128),

publisher VARCHAR(32),

year DATE,

ISBN10 CHAR(10) NOT NULL UNIQUE,

ISBN13 CHAR(14) PRIMARY KEY,

)

1. Insert one book called “Introduction to Database Systems”. Go to the Web to find actual details.

INSERT INTO book VALUES ('Introduction to Database Systems', 'Paperback', 168, 'Stephane Bressan and Barbara Catania', 'MacGraw-Hill', '2005-01-01', '0071246509', '978-0071246507')

1. Insert half a dozen books you can find with title containing “Introduction to Database Systems” or authored by C.J. Date. Go to the Web, for instance amazon.com, to find the details.

INSERT INTO book VALUES ('An Introduction to Database Systems', 'Paperback', 1024, 'C.J. Date', 'Addison-Wesley', '2003-08-01', '0321197844', '978-0321197849')

INSERT INTO book VALUES ('Introduction to Database Systems (Management Information Systems)', 'Paperback', 29, 'R. Dixon, G. Rawlings', 'CIMA Publishing', '1998-12-01', '0948036230', '978-0948036231')

INSERT INTO book VALUES ('Introduction to Database Systems', 'Hardcover', 650, 'Bipin C. Desai', 'West Group', '1990-08-01', '0314667717', '978-0314667717')

INSERT INTO book VALUES ('SQL and Relational Theory: How to Write Accurate SQL Code', 'Paperback', 432, 'C.J. Date', 'O Reilly Media', '2009-01-23, '0596523068', '978-0596523060')

1. Modify all the Books authored by C.J. Date to mention the author’s first name (find the author’s first name from the Web.)

UPDATE book SET authors=‘Christopher J. Date’ WHERE authors= ‘C. J. Date’

1. Print all the information about books

SELECT \* FROM book

1. Delete all the books authored by C.J. Date

DELETE FROM book

WHERE authors=’Christopher J. Date’

DELETE FROM book

WHERE authors LIKE ‘C%Date’

1. Find the title, format, number of pages, authors, publisher, year, edition, ISBN-10 and -13 of the books.

SELECT title, format, pages, authors, publisher, year, edition, ISBN10, ISBN13 FROM book

1. Find the titles of the books.

SELECT title FROM book

SELECT DISTINCT title FROM book

1. Find the authors of the books called “Introduction to Database Systems”.

SELECT authors FROM book WHERE title=’Introduction to Database Systems’

1. Add a language attribute to all books. Set the default language to English.

ALTER TABLE book

ADD language VARCHAR(32) DEFAULT ‘English’

INSERT INTO book (title, format, pages, authors, publisher, year, ISBN10, ISBN13) VALUES ('SQL and Relational Theory: How to Write Accurate SQL Code', 'Paperback', 432, 'C.J. Date', 'O Reilly Media', '2009-01-23', '0596523068', '978-0596523060')

1. Create the tables for the remainder of this tutorial using the code in NUSStASchema.sql. Populate the tables using NUSStAData.sql. You can use NUSStAClean.sql to remove all data and tables. The files are available in IVLE workbin.