week_7_assignment

Adejare Windokun

Wednesday, October 08, 2014

Will need RPostgreSQL which contains the driver and connectivity functions to interact with the PostgreSQL Server

```
if (!require(RPostgreSQL)) install.packages('RPostgreSQL')
```

```
## Loading required package: RPostgreSQL
## Loading required package: DBI
```

```
library(RPostgreSQL)
```

1. Create a new database in PostgreSQL. You may use a graphical tool to populate the database. Already did this using the graphical tool provided pgAdmin III **********
2. Populate your newly created database with two tables that have a one-to-many relationship. You should create the two tables using the CREATE TABLE command. There should be at least one example each of integer, numeric, character, and a date data type in at least one of the two tables. There should be at least one character column that allows NULLs. Deliverable: Your two CREATE TABLE statements.

Will create the database

```
drv =dbDriver("PostgreSQL")
con <- dbConnect(drv, user= "postgres", password="cuny2014")
sql = 'DROP DATABASE IF EXISTS "Books" ;'
rs = dbSendQuery(con, sql)
sql = 'CREATE DATABASE "Books"'
rs = dbSendQuery(con, sql)
dbDisconnect (con)
```

```
## [1] TRUE
```

Then the two tables - The Author table that stores information on the Authors

```
con <- dbConnect(drv, user= "postgres", password="cuny2014", dbname = "Books")
sql = paste('DROP TABLE IF EXISTS Authors CASCADE;',

'CREATE TABLE Authors
(
    author_id serial PRIMARY KEY,
    fname VARCHAR (25) NOT NULL,
    lname VARCHAR (20) NOT NULL,
    phone VARCHAR (10) NULL,
    zipcode INTEGER NULL,
    created_on timestamp without time zone DEFAULT now()
);')
```

```
rs = dbSendQuery(con, sql)

dbDisconnect(con)
```

```
## [1] TRUE
```

The Titles table that stores the book titlies

```
con <- dbConnect(drv, user= "postgres", password="cuny2014", dbname = "Books")
sql = paste('DROP TABLE IF EXISTS Titles;',

'CREATE TABLE Titles
(
    book_ID serial PRIMARY KEY,
    book_author INTEGER REFERENCES Authors(author_id),
    ISBN VARCHAR (25) NOT NULL,
    book_title VARCHAR (50) NOT NULL,
    subject VARCHAR (50) NULL,
    rating INTEGER NULL,
    price NUMERIC NULL,
    publish_date DATE NOT NULL


);')

rs = dbSendQuery(con, sql)
dbDisconnect(con)
```

```
## [1] TRUE
```

3. Populate the two tables with some sample data, using INSERT statements. Each table should contain at least three records, and the data should accurately reflect the one-to-many relationship. There should also be at least one row where the character column that allows NULL values has a value of NULL. Deliverable: your set of INSERT statements.

```
con <- dbConnect(drv, user= "postgres", password="cuny2014", dbname = "Books")

sql = "INSERT INTO Authors (fname, lname, phone, zipcode)

VALUES

    ('James', 'Brown', '3102366369', 47898),
    ('Jill', 'Thomas', '1234567896', 85258),
    ('Susan', 'Waters', '5052588969', 20025),
    ('Tom', 'Baldwin', '9899699696', 90059);"


rs = dbSendQuery(con, sql)
dbGetRowsAffected(rs)
```

```
## [1] 4
```

```
dbDisconnect(con)
```

```
## [1] TRUE
```

Will hard code in the values of book_author for this excercise, In practice would have used a select statement to look up the book_author for the authors table

```
con <- dbConnect(drv, user= "postgres", password="cuny2014", dbname = "Books")

sql = "INSERT INTO Titles (book_author, isbn, book_title, subject, rating, price, publish_date)

VALUES

    (1, '0-85131-041-9', 'The Art of Unix Programming', 'Math', 5, 39.99, to_date('2014','YYYY')),
    (1, '85-359-0277-5', 'The Art of Computer Programming', 'Science', 3, 29.99, to_date('2013', 'YYYY'
    (1, '80-902734-1-6', 'Hacker Culture', 'Literature', NULL, 19.59, to_date('2000', 'YYYY')),

    (2, '960-425-059-0', 'Catch - 22', 'Chemistry', 1, 105.25, to_date('2001', 'YYYY')),
    (2, '9971-5-0210-0', 'Ulysses', 'Biology', 2, 78.25, to_date('2015', 'YYYY')),

    (3, '99921-58-10-7', 'The Hacker Crackdown', 'Computer Science', 4, 25.36, to_date('2005', 'YYYY'))


rs = dbSendQuery(con, sql)
dbGetRowsAffected(rs)
```

```
## [1] 6
```

```
dbDisconnect(con)
```

```
## [1] TRUE
```

Provide samples of the different kinds of joins across the two tables. You should include one join that performs a WHERE on the COLUMN that allows a NULL value. Deliverable: Your SELECT statements.

```
con <- dbConnect(drv, user= "postgres", password="cuny2014", dbname = "Books")

sql1 = 'SELECT * FROM authors, titles WHERE authors.author_id = titles.book_author;'
sql2 = 'SELECT * FROM authors, titles WHERE authors.author_id = titles.book_author AND titles.rating IS
sql3 = 'SELECT * FROM authors  INNER JOIN titles ON authors.author_id = titles.book_author;'
sql4 = 'SELECT * FROM authors  RIGHT JOIN titles ON authors.author_id = titles.book_author;'
sql5 = 'SELECT * FROM authors  FULL JOIN titles ON authors.author_id = titles.book_author;'
```

**********Select query showing Authors and Book Details**********

```
dbGetQuery(con, sql1)
```

```
##   author_id fname  lname      phone zipcode          created_on book_id
## 1         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       1
## 2         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       2
```

```
## 3         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       3
## 4         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       4
## 5         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       5
## 6         3 Susan Waters 5052588969   20025 2014-10-09 22:01:47       6
##   book_author          isbn                      book_title
## 1           1 0-85131-041-9     The Art of Unix Programming
## 2           1 85-359-0277-5 The Art of Computer Programming
## 3           1 80-902734-1-6                 Hacker Culture
## 4           2 960-425-059-0                     Catch - 22
## 5           2 9971-5-0210-0                        Ulysses
## 6           3 99921-58-10-7           The Hacker Crackdown
##            subject rating  price publish_date
## 1             Math      5  39.99   2014-01-01
## 2          Science      3  29.99   2013-01-01
## 3       Literature     NA  19.59   2000-01-01
## 4        Chemistry      1 105.25   2001-01-01
## 5          Biology      2  78.25   2015-01-01
## 6 Computer Science      4  25.36   2005-01-01
```

**********Select query showing Authors and Book Details that performs a Where on a null column**********

```
dbGetQuery(con, sql2)
```

```
##   author_id fname  lname      phone zipcode          created_on book_id
## 1         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       1
## 2         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       2
## 3         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       4
## 4         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       5
## 5         3 Susan Waters 5052588969   20025 2014-10-09 22:01:47       6
##   book_author          isbn                      book_title
## 1           1 0-85131-041-9     The Art of Unix Programming
## 2           1 85-359-0277-5 The Art of Computer Programming
## 3           2 960-425-059-0                     Catch - 22
## 4           2 9971-5-0210-0                        Ulysses
## 5           3 99921-58-10-7           The Hacker Crackdown
##            subject rating  price publish_date
## 1             Math      5  39.99   2014-01-01
## 2          Science      3  29.99   2013-01-01
## 3        Chemistry      1 105.25   2001-01-01
## 4          Biology      2  78.25   2015-01-01
## 5 Computer Science      4  25.36   2005-01-01
```

**********Select query showing Authors and Book Details that performs an INNER JOIN**********

```
dbGetQuery(con, sql3)
```

```
##   author_id fname  lname      phone zipcode          created_on book_id
## 1         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       1
## 2         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       2
## 3         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       3
## 4         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       4
## 5         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       5
```

```
## 6         3 Susan Waters 5052588969   20025 2014-10-09 22:01:47       6
##   book_author          isbn                      book_title
## 1           1 0-85131-041-9     The Art of Unix Programming
## 2           1 85-359-0277-5 The Art of Computer Programming
## 3           1 80-902734-1-6                  Hacker Culture
## 4           2 960-425-059-0                      Catch - 22
## 5           2 9971-5-0210-0                         Ulysses
## 6           3 99921-58-10-7            The Hacker Crackdown
##            subject rating  price publish_date
## 1             Math      5  39.99   2014-01-01
## 2          Science      3  29.99   2013-01-01
## 3       Literature     NA  19.59   2000-01-01
## 4        Chemistry      1 105.25   2001-01-01
## 5          Biology      2  78.25   2015-01-01
## 6 Computer Science      4  25.36   2005-01-01
```

**********Select query showing Authors and Book Details that performs an RIGHT JOIN**********

```
dbGetQuery(con, sql4)
```

```
##   author_id fname  lname      phone zipcode          created_on book_id
## 1         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       1
## 2         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       2
## 3         1 James  Brown 3102366369   47898 2014-10-09 22:01:47       3
## 4         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       4
## 5         2  Jill Thomas 1234567896   85258 2014-10-09 22:01:47       5
## 6         3 Susan Waters 5052588969   20025 2014-10-09 22:01:47       6
##   book_author          isbn                      book_title
## 1           1 0-85131-041-9     The Art of Unix Programming
## 2           1 85-359-0277-5 The Art of Computer Programming
## 3           1 80-902734-1-6                  Hacker Culture
## 4           2 960-425-059-0                      Catch - 22
## 5           2 9971-5-0210-0                         Ulysses
## 6           3 99921-58-10-7            The Hacker Crackdown
##            subject rating  price publish_date
## 1             Math      5  39.99   2014-01-01
## 2          Science      3  29.99   2013-01-01
## 3       Literature     NA  19.59   2000-01-01
## 4        Chemistry      1 105.25   2001-01-01
## 5          Biology      2  78.25   2015-01-01
## 6 Computer Science      4  25.36   2005-01-01
```

**********Select query showing Authors and Book Details that performs a FULL JOIN**********

```
dbGetQuery(con, sql5)
```

```
##   author_id fname   lname      phone zipcode          created_on book_id
## 1         1 James   Brown 3102366369   47898 2014-10-09 22:01:47       1
## 2         1 James   Brown 3102366369   47898 2014-10-09 22:01:47       2
## 3         1 James   Brown 3102366369   47898 2014-10-09 22:01:47       3
## 4         2  Jill  Thomas 1234567896   85258 2014-10-09 22:01:47       4
## 5         2  Jill  Thomas 1234567896   85258 2014-10-09 22:01:47       5
```

```
## 6         3 Susan  Waters 5052588969   20025 2014-10-09 22:01:47       6
## 7         4   Tom Baldwin 9899699696   90059 2014-10-09 22:01:47      NA
##   book_author          isbn                      book_title
## 1           1 0-85131-041-9     The Art of Unix Programming
## 2           1 85-359-0277-5 The Art of Computer Programming
## 3           1 80-902734-1-6                 Hacker Culture
## 4           2 960-425-059-0                     Catch - 22
## 5           2 9971-5-0210-0                        Ulysses
## 6           3 99921-58-10-7            The Hacker Crackdown
## 7          NA          <NA>                            <NA>
##            subject rating  price publish_date
## 1             Math      5  39.99   2014-01-01
## 2          Science      3  29.99   2013-01-01
## 3       Literature     NA  19.59   2000-01-01
## 4        Chemistry      1 105.25   2001-01-01
## 5          Biology      2  78.25   2015-01-01
## 6 Computer Science      4  25.36   2005-01-01
## 7             <NA>     NA     NA         <NA>
```

```
dbDisconnect (con)
```

```
## [1] TRUE
```

Clean up

```
dbDisconnect (con)
```

```
## [1] TRUE
```

```
dbUnloadDriver(drv)
```

```
## [1] TRUE
```

```
drv = NULL
con = NULL
```

‘‘‘

5. Create an Entity-Relationship (ER) diagramthat shows the two tables that you created. An example of an ER diagram can be found here: http://www.postgresqltutorial.com/wp-content/uploads/2013/05/PostgreSQL-Sample-Database.png. You can generate the ER diagram with a tool, or hand-sketch, then photograph or scan. Deliverable: a .PNG or .PDF of your ER diagram.

Will attach a PDF