

# How to SQL (Sierra)

## Part 1

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Sunday, May 5<sup>th</sup> | Pre-Conference

Monday, May 6<sup>th</sup> – Wednesday, May 8<sup>th</sup> | Main Conference

# Overview

- Intro
- Getting started
  - Getting set up to use SQL
  - How to use the software
- SQL basics
  - SELECT, FROM, WHERE, ORDER BY, GROUP BY, HAVING, JOIN, subqueries



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# Introduction: SQL

- Comes with every Sierra system
- Read-only access
- Access to most but not all data
- Can access in lots of different ways
- Sierra uses PostgreSQL



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# Official Resources, Innovative

- Manual: Sierra Direct SQL Access
  - Getting Started
  - Sierra DNA
  - Query Examples
  - Troubleshooting
- Sierra DNA: <http://techdocs.iii.com/sierradna/>
- Innovative Developer Network:  
<https://developer.iii.com/>



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# Official Resources, PostgreSQL

- PostgreSQL

<https://www.postgresql.org/docs/10/static/queries.html>



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# IUG Resources

- IUG Forum – Sierra SQL category
- IUG Clearinghouse
- Past conference presentations
  
- All at <http://innovativeusers.org/>



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# Resources from Other Customers

- Public Library of Cincinnati & Hamilton County
  - <https://github.com/plch/sierra-sql/wiki>
- Jeremy Goldstein
  - <https://github.com/jmgold/SQL-Queries>
- Joe Montibello
  - <https://github.com/joemontibello/iii-sql-queries>
- UNC-Libraries
  - <https://github.com/UNC-Libraries/III-Sierra-SQL/wiki>



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# Other Resources

- WiseOwl Training Videos
  - <https://www.wiseowl.co.uk/sql/videos/sql-selecting-data/>
- Stanford free online mini-courses in SQL
  - <https://lagunita.stanford.edu/courses/DB/2014/SelfPaced/about>
- Codecademy
  - <https://www.codecademy.com/catalog/language/sql>
- SQL Cookbook by Anthony Molinaro



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# Getting Set Up

## Sierra Documentation

### Sierra Direct SQL Access > Getting Started

sierra documentation

Search  

Contents Index Browse

direct

- authority redirects
- Direct Connect
- Direct SQL Access**
- > directory
- Elsevier ScienceDirect

You are here: Sierra Direct SQL Access

## Sierra Direct SQL Access

 Innovative does not provide end-user support for creating SQL queries. Sierra Direct SQL Access users assume responsibility for the effects of custom SQL. Poorly-constructed queries can compromise system performance.

The Sierra Services Platform incorporates a PostgreSQL relational database that captures the library's material, circulation, patron, financial, and operational data. A collection of database views provides direct access to the library's bibliographic and transactional data. Each view is constructed from one or more tables and can be queried as a single table. Views are read-only.

 Note that Sierra updates most of the database views storing the parameters which are accessed in Sierra via one of the Admin | Parameters menus nightly. Edits to these parameters may not show up immediately in SQL query results.

With Sierra Direct SQL Access, you can create custom reports on any configuration of data, integrate with other systems, and create custom applications.

The SierraDNA provides documentation of all views and their constituent columns.

The following resources can help you take advantage of Sierra Direct SQL Access:



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# Getting Set Up

## 1. Set up user

Home | Authorizations and Authentication Admin You are signed in as Phil Shirley (pshirley) | more ▾

Applications

Filter list by typing here

Application ▾

- + Admin App
- + Dashboard
- + Sierra Application
- Sierra SQL Access

EDIT

Assigned users (5)

Users Applications Permissions Workflows User Groups



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# Getting Set Up



2. Ensure firewall access to port 1032



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# Getting Set Up

## 3. Install pgAdmin

[https://www.pgadmin.org/  
download/](https://www.pgadmin.org/download/)

### Quick Links

[Screenshots](#)[Download](#)[Docs](#)[Support Mailing  
List](#)

## Download

pgAdmin is a free software project released under the PostgreSQL Artistic licence. The software is available in source and binary format from the [PostgreSQL mirror network](#). Because compiling from source requires technical knowledge, we recommend installing binary packages whenever possible.

The pages in this section give additional details about each binary package available as well as more direct download links. In addition, you can download source tarballs and pgAgent for your servers to enable additional functionality.

### pgAdmin 4

pgAdmin 4 is a complete rewrite of pgAdmin, built using Python and Javascript/jQuery. A desktop runtime written in C++ with Qt allows it to run standalone for individual users, or the web application code may be deployed directly on a webserver for use by one or more users through their web browser. The software has the look and feel of a desktop application whatever the runtime environment is, and vastly improves on pgAdmin III with updated user interface elements, multi-user/web deployment options, dashboards and a more modern design.

[Container](#)[macOS](#)[Python Wheel](#)[APT](#)[RPM](#)[Source Code](#)[Windows](#)

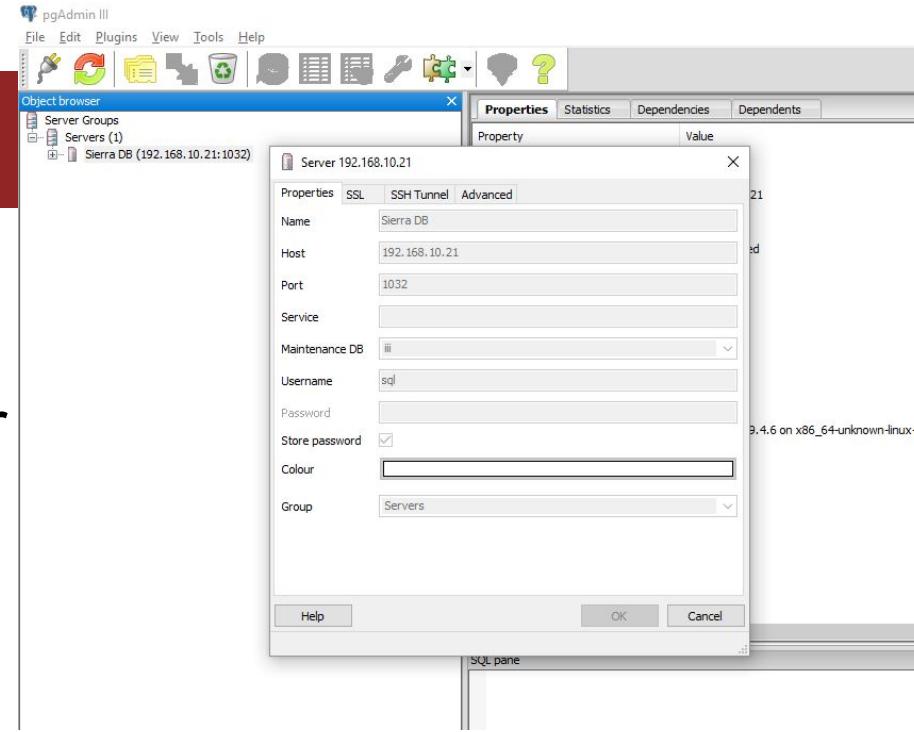
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# Getting Set Up

## 4. Configure pgAdmin

Name: Whatever you want

Host: Sierra *database* server



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# How to Use pgAdmin

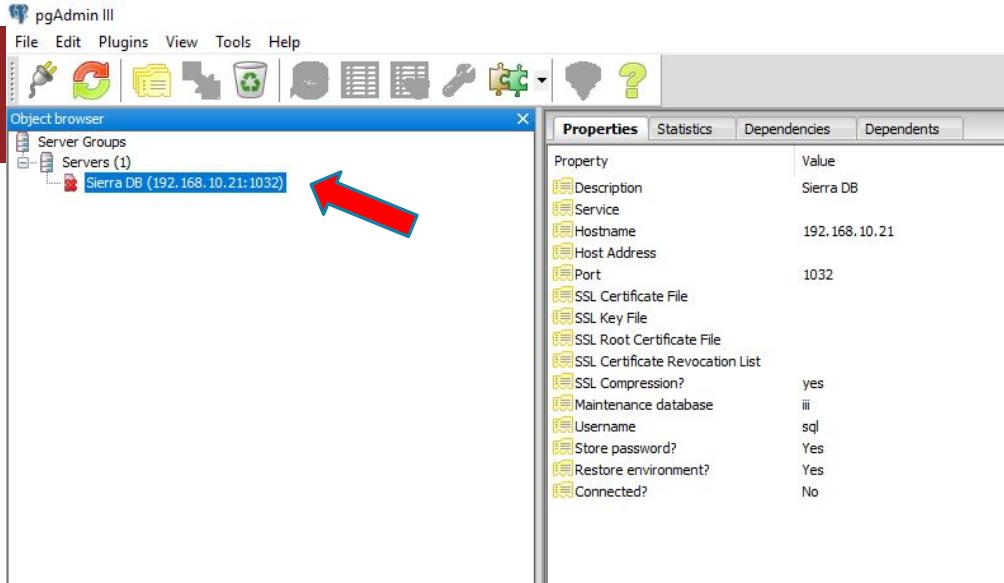


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# To Connect

- Expand Servers
- Double-click



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# Views

Servers > [name] > Databases >  
Schemas > sierra\_view > Views

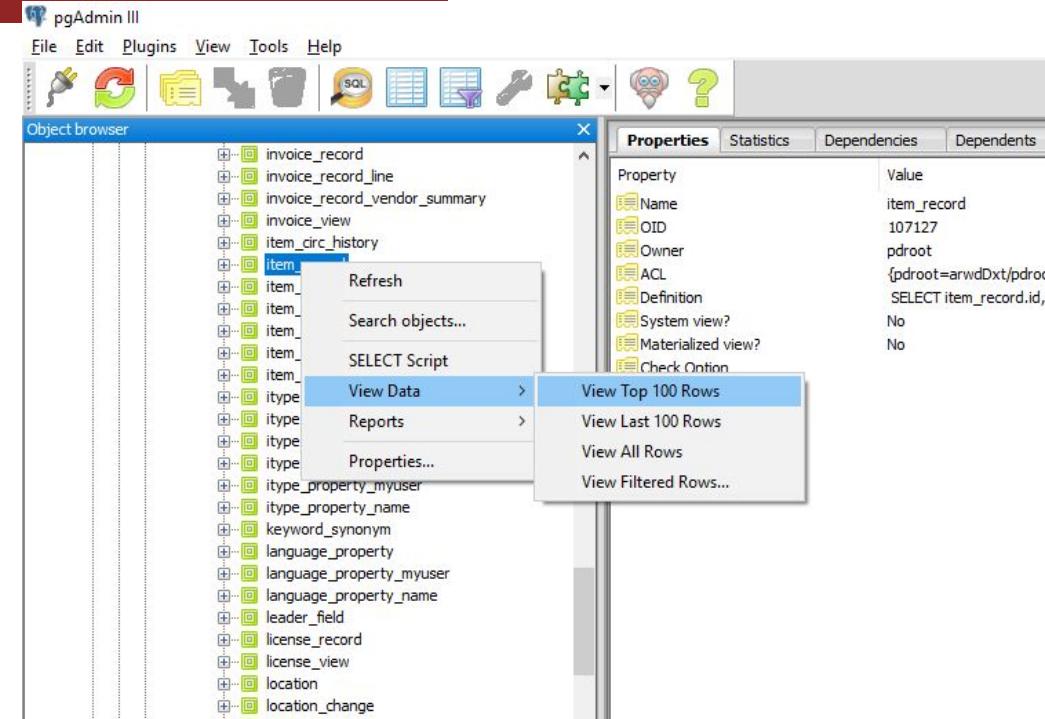
The screenshot shows the pgAdmin III interface. The title bar says "pgAdmin III". The menu bar includes File, Edit, Plugins, View, Tools, and Help. The toolbar has icons for New, Open, Save, Print, and others. The "Object browser" panel on the left shows a tree structure: Server Groups > Servers (1) > Sierra DB (192.168.10.21:1032) > Databases (2) > Catalogs (2), Extensions (2), Schemas (10), and Views (349). The "Properties" tab in the top right shows a table with columns View, Owner, and Comment. The "Comment" column lists numerous views such as accounting\_trans..., pdroot, accounting\_trans..., pdroot, etc. The "SQL pane" at the bottom is empty.



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# Ways to Learn About a View

Right click > View Data >  
View Top 100 Rows



	<b>id bigint</b>	<b>record_id bigint</b>	<b>icode1 integer</b>	<b>icode2 character(1)</b>	<b>itype_code_num smallint</b>	<b>location_code character varying(5)</b>	<b>agency_code_num smallint</b>	<b>item_status_code character varying(3)</b>	<b>is_inherit_loc boolean</b>	<b>price numer</b>
<b>1</b>	3941100652988071	3941100652988071	0	-	230	9cinc	0	ap	FALSE	0.0000
<b>2</b>	10133550135207265	10133550135207265	0	-	230	re2pl	0	ap	FALSE	0.0000
<b>3</b>	6474375437855531	6474375437855531	0	-	230	pc2pl	0	ap	FALSE	0.0000
<b>4</b>	1126350881433238	1126350881433238	0	-	230	t1lpl	0	ap	FALSE	0.0000
<b>5</b>	30962698412117321	30962698412117321	0	-	231	9cler	0	ap	FALSE	0.0000
<b>6</b>	4504050600725359	4504050600725359	0	-	230	9midp	0	ap	FALSE	0.0000
<b>7</b>	450972566211	450972566211	0	-	10	non	0	-	FALSE	24.950
<b>8</b>	1407825856742974	1407825856742974	0	-	230	9lane	0	ap	FALSE	0.0000
<b>9</b>	3941100652814480	3941100652814480	0	-	231	9cinc	0	ap	FALSE	0.0000
<b>10</b>	4785525577381147	4785525577381147	0	-	231	9wcpl	0	ap	FALSE	0.0000
<b>11</b>	450972871833	450972871833	0	-	10	fic	0	-	FALSE	24.950
<b>12</b>	450972674256	450972674256	0	-	10	jnon	0	-	FALSE	12.350
<b>13</b>	3378150696429195	3378150696429195	0	-	230	9ascp	0	ap	FALSE	0.0000
<b>14</b>	1689300833192927	1689300833192927	0	-	231	9ment	0	ap	FALSE	0.0000
<b>15</b>	450973024698	450973024698	0	-	10	jgrap	0	-	FALSE	26.650
<b>16</b>	3941100653275535	3941100653275535	0	-	230	9cinc	0	ap	FALSE	0.0000
<b>17</b>	281925950139744	281925950139744	0	-	230	we4pl	0	ap	FALSE	0.0000
<b>18</b>	450973133240	450973133240	0	-	42	crock	0	-	FALSE	13.980
<b>19</b>	281925944593150	281925944593150	0	-	231	mednl	n	ap	FAT_SF	n nnnn



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# Ways to Learn About a View

Sierra DNA  
(Documentation NAVigator)  
[https://techdocs.iii.com/  
sierradna/](https://techdocs.iii.com/sierradna/)

Sierra DNA Documentation NAVigator

Sierra SQL Help  DRAFT

Search Views  All fields (change)

Item

[Detailed View](#) | [ERD View](#)

**bib\_record\_item\_record\_link**

Each row of bib\_record\_item\_record\_link identifies a linked bibliographic and item record pair.

Column	Data Type	Not NULL?	Comment
id	bigint	false	System-generated sequential ID.
bib_record_id	bigint	false	Foreign key to bib_record.
item_record_id	bigint	false	Foreign key to item_record.
items_display_order	int	false	Integer to manage the display order of an items list.
bibs_display_order	int	false	Integer to manage the display order of a bibliographic record list.

**course\_record\_item\_record\_link**

Each row of course\_record\_item\_record\_link identifies a linked course and item record pair.



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# Sierra DNA

## circ\_trans

Each row of circ\_trans contains information about a circulation transaction.

Column	Data Type	Not NULL?	Comment								
id	int	false	System-generated sequential ID.								
transaction_gmt	timestamptz	false	Transaction date in UNIX format.								
application_name	varchar	false	The name of the program that generated the transaction. Valid program names are: <ul style="list-style-type: none"><li>• circ (includes transactions made using PC Circ)</li><li>• circa (for transactions written by selfcheckwebserver and in-house use [transaction codes 'u' and 's'], which use webpac to execute transactions.)</li><li>• milcirc</li><li>• milmyselfcheck</li><li>• readreq</li><li>• selfcheck</li></ul>								
source_code	varchar	false	The transaction source. Possible values are: <ul style="list-style-type: none"><li>• local</li><li>• INN-Reach</li><li>• ILL</li></ul>								
op_code	varchar	false	Type of transaction: <table border="1"><tr><td>o = checkout</td><td>i = checkin</td></tr><tr><td>n = hold nb = bib hold ni = item hold nv = volume hold</td><td>h = hold with recall hb = hold recall bib hi = hold recall item hv = hold recall volume</td></tr><tr><td>f = filled hold</td><td>r = renewal</td></tr><tr><td>b = booking</td><td>u = use count</td></tr></table>	o = checkout	i = checkin	n = hold nb = bib hold ni = item hold nv = volume hold	h = hold with recall hb = hold recall bib hi = hold recall item hv = hold recall volume	f = filled hold	r = renewal	b = booking	u = use count
o = checkout	i = checkin										
n = hold nb = bib hold ni = item hold nv = volume hold	h = hold with recall hb = hold recall bib hi = hold recall item hv = hold recall volume										
f = filled hold	r = renewal										
b = booking	u = use count										



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Search Views



All fields (change)

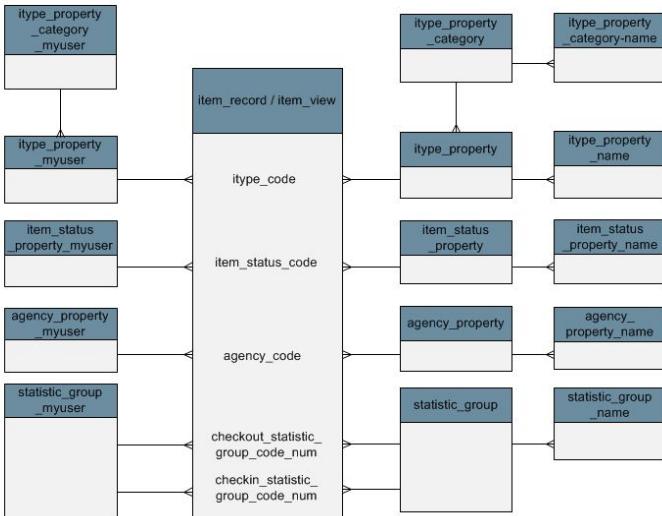
# ERD View

sierraDNA

Entities

- [Generic Record](#)
- [Authority](#)
- [Bib](#)
- [Contact](#)
- [Course](#)
- [Holding](#)
- [Invoice](#)
- [Item](#)
- [License](#)
- [Order](#)
- [Patron](#)
- [Program](#)
- [Resource](#)
- [Section](#)
- [Vendor](#)
- [Volume](#)
- [Users](#)

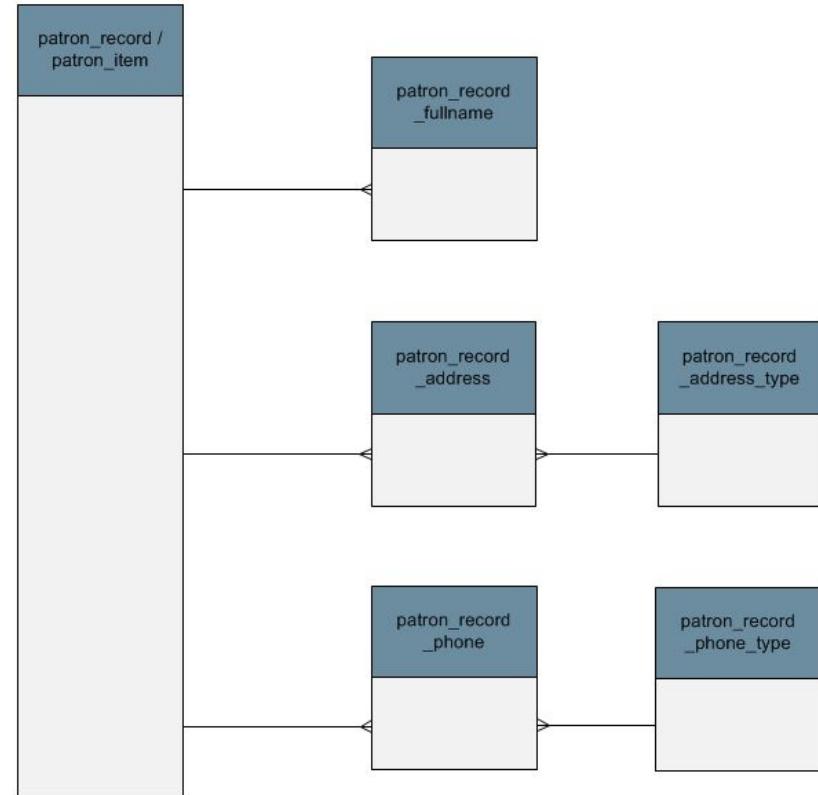
Item

[Detailed View](#)[ERD View](#)

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# Sierra DNA: Some Views

- patron\_record
- patron\_view
- patron\_record\_address
- patron\_address\_type
- patron\_record\_fullname
- patron\_record\_phone
- patron\_record\_phone\_type



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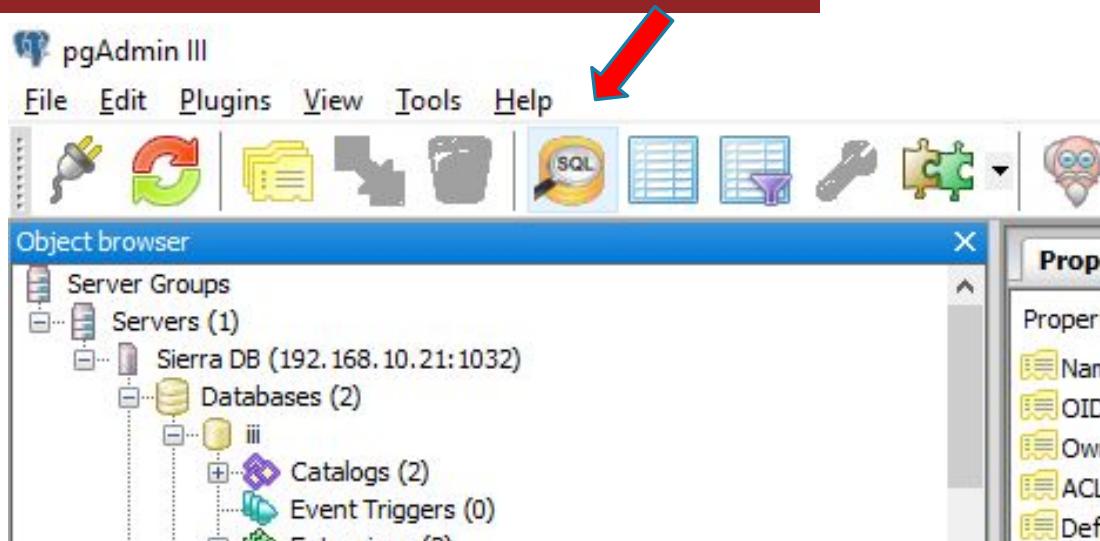
## item\_record vs. item\_view

- item\_view also includes metadata like the item record number and the record creation date.
- item\_view also contains barcode.
- item\_record contains is\_available\_at\_library.
- item\_view is less efficient



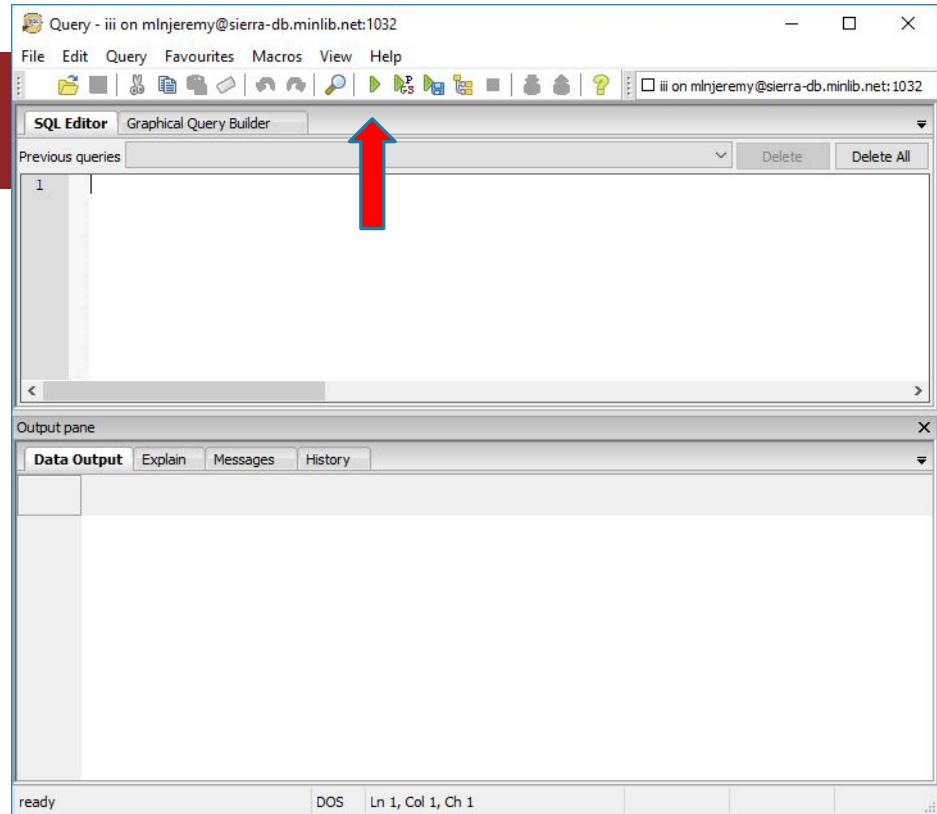
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# Entering SQL Queries in pgAdmin



# SQL Window

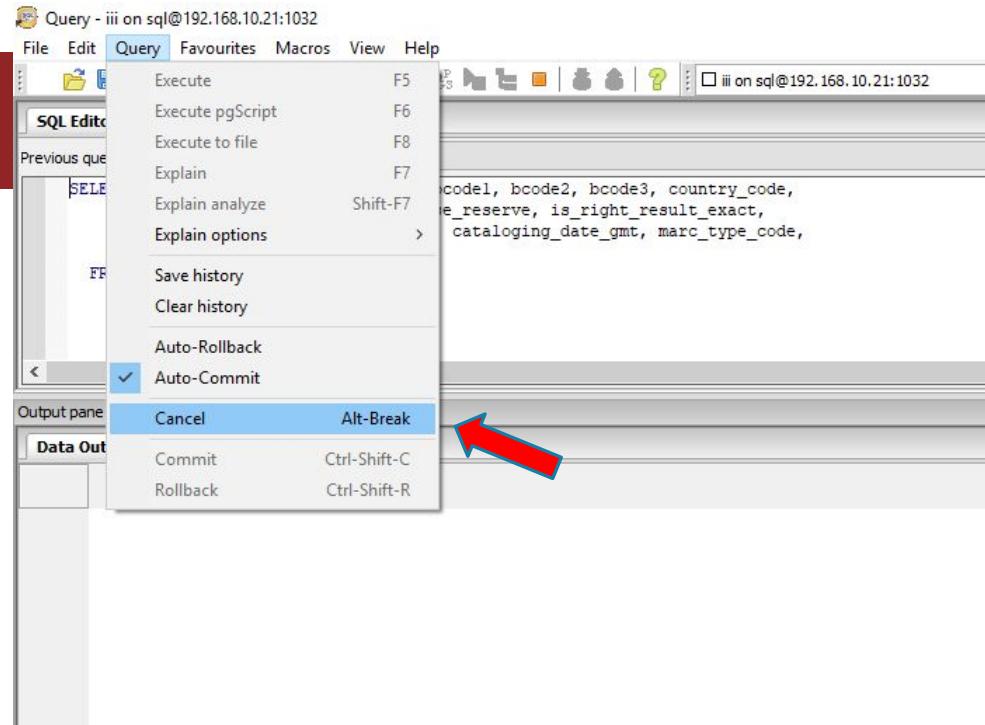
1. Type your query
2. Click the green triangle  
(or press F5)



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# Canceling It

- Query – Cancel  
(or press Alt-Break)



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# Results

Results appear below

The screenshot shows the MySQL Workbench interface. The top menu bar includes File, Edit, Query, Favourites, Macros, View, Help, and a connection status indicator. Below the menu is a toolbar with various icons. The main window has tabs for 'SQL Editor' and 'Graphical Query Builder', with 'SQL Editor' selected. A 'Previous queries' dropdown and two 'Delete' buttons are also present. The SQL editor contains the following query:

```
SELECT
    item_view.record_num,
    item_view.barcode
FROM
    sierra_view.item_view
LIMIT 10;
```

The 'Output pane' below the editor displays the results in a tabular format. The results are as follows:

	record_num	barcode
	integer	character varying(1000)
1	1409523	ITMPL004814752
2	1629857	ITMPL006175675
3	1348867	ITMPL004814828
4	1000974	ITMPL000650100
5	1001150	ITMPL000930098
6	1575935	ITMPL005647037
7	1001882	ITMPL090129718
8	1435826	ITMPL004225801
9	1461996	ITMPL004480786

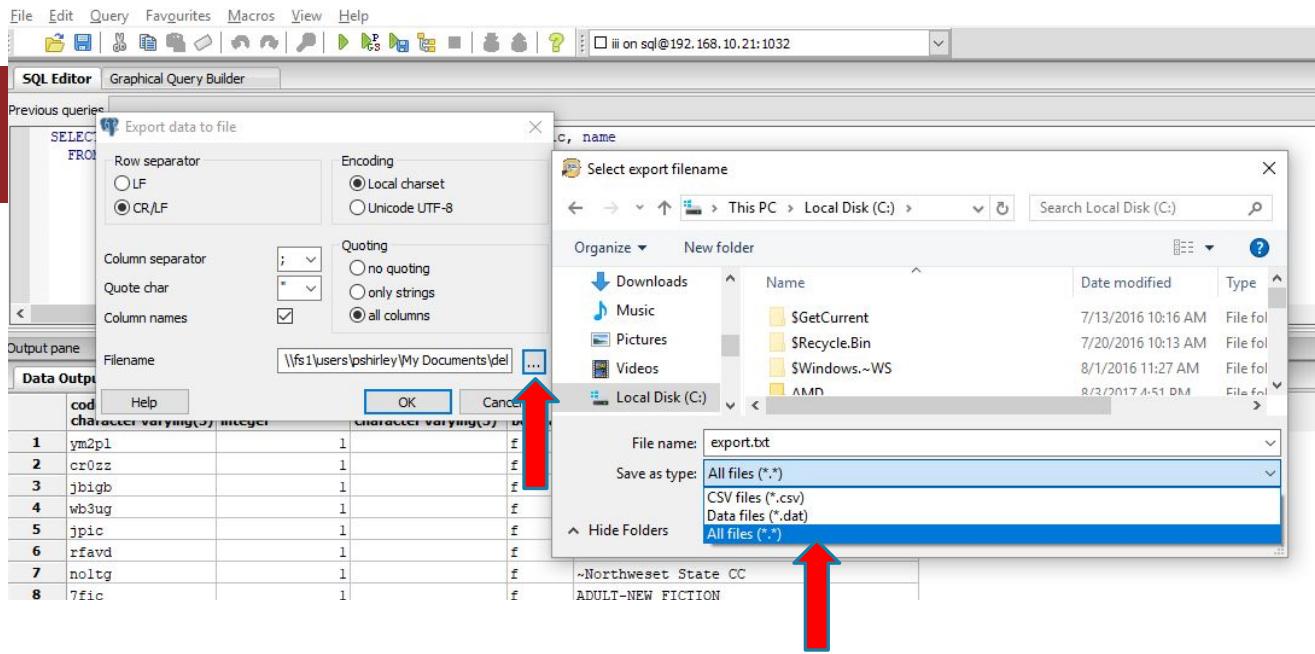
A red arrow points from the text 'Results appear below' to the output table. The bottom status bar shows 'OK.', 'DOS', 'Ln 7, Col 1, Ch 100', and '10 row'.



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# Export

- File – Export
- Click “...”
- Something.txt
- Change CSV to All files



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# Open in Excel

- Delimited

Text Import Wizard - Step 1 of 3

The Text Wizard has determined that your data is Delimited.

If this is correct, choose Next, or choose the data type that best describes your data.

Original data type

Choose the file type that best describes your data:

Delimited - Characters such as commas or tabs separate each field.  
 Fixed width - Fields are aligned in columns with spaces between each field.

Start import at row: 1 File origin: 437 : OEM United States

My data has headers.

Preview of file \\fs1\users\pshirley\my documents\del.txt.

1	"code";"display_order";"name"
2	"@";"10";"SearchOhio OFF-SITE"
3	" ";"11";"SearchOhio RE-REQ'D"
4	"#";"1";"SearchOhio REC'D"
5	"e";"1€";"ON DISPLAY"

Cancel < Back **Next >** Finish



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# Open in Excel

- Semicolon
- Finish

## Text Import Wizard - Step 2 of 3



This screen lets you set the delimiters your data contains. You can see how your text is affected in the preview below.

### Delimiters

- Tab
- Semicolon
- Comma
- Space
- Other:

- Treat consecutive delimiters as one

Text qualifier: <input type="button" value="▼" style="vertical-align: middle; margin-left: 10px; border: 1px solid #ccc; padding: 2px 5px; border-radius: 3px; font-size: small; font-weight: normal; font-family: inherit; background-color: transparent; color: inherit; text-decoration: none; text-align: center; width: 15px; height: 15px; margin-right: 10px; />

### Data preview

code	display_order	name
@	10	SearchOhio OFF-SITE
-	11	SearchOhio RE-REQ'D
#	1	SearchOhio REC'D
e	16	ON DISPLAY

Cancel

< Back

Next >

Finish



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# Saving Queries, Opening Saved Queries

- File - Save
- File - Open



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# SQL Queries



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# What a SQL Query Looks Like

SELECT

```
item_record.record_id,  
item_record.last_checkin_gmt,  
item_record.location_code
```

FROM

```
sierra_view.item_record;
```



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# What a SQL Query Looks Like

SELECT

```
item_record.record_id,  
item_record.last_checkin_gmt,  
item_record.location_code
```

FROM

```
sierra_view.item_record;
```



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# What a SQL Query Looks Like

SELECT

```
Item_record.record_id,  
Item_record.last_checkin_gmt,  
item_record.location_code
```

FROM

```
Sierra_view.item_record;
```



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# Comments

-- Returns record numbers, last checkin, and barcodes

SELECT

```
Item_record.record_id,  
last_checkin_gmt,  
item_record.location_code
```

FROM

```
sierra_view.item_record;
```



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# Very Little White Space

```
SELECT item_record.record_id, last_checkin_gmt,  
item_record.location_code FROM sierra_view.item_record;
```



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# Plenty of White Space

```
SELECT  
    item_record.record_id,  
    last_checkin_gmt,  
    item_record.location_code  
  
FROM  
    sierra_view.item_record;
```



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# AS: Aliases for Column Headings

```
SELECT  
    item_record.id AS item_id,  
    item_record.last_checkin_gmt AS last_checkin,  
    item_record.location_code AS location  
FROM  
    sierra_view.item_record;
```



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# Double Quotes (Spaces, Capitalization)

```
SELECT  
    item_record.id AS "Item ID",  
    item_record.last_checkin_gmt AS "Last checkin",  
    item_record.location_code AS "Location"  
FROM  
    sierra_view.item_record;
```



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# Alias for a Table

```
SELECT  
    i.record_id AS "Item ID",  
    i.last_checkin_gmt AS "Last checkin",  
    i.location_code AS "Location"  
FROM  
    sierra_view.item_record i;
```



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# A Few Functions: id2reckey()

```
SELECT  
    id2reckey(i.record_id) AS "Record number",  
    i.last_checkin_gmt AS "Last checkin",  
    i.location_code AS "Location"  
FROM  
    sierra_view.item_record i;
```



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# A Few Functions: Concatenation

SELECT

```
CONCAT(id2reckey(i.record_id), 'a') AS "Record number",  
last_checkin_gmt AS "Last checkin",  
i.location_code AS "Location"
```

FROM

```
sierra_view.item_record i;
```



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# Time Stamps

	<b>Record number bigint</b>	<b>Last checkin timestamp with time zone</b>	<b>Location character varying(5)</b>
<b>1</b>	3941100652988071	2014-03-11 15:22:09-04	9cinc
<b>2</b>	10133550135207265	2016-01-10 15:39:53.411-05	re2pl
<b>3</b>	6474375437855531	2015-09-29 14:34:21.077-04	pc2pl
<b>4</b>	1126350881433238	2015-07-16 09:07:05.766-04	tllpl
<b>5</b>	30962698412117321	2015-08-22 10:26:40.819-04	9cler



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# Extracting date from a time stamp

```
SELECT  
    i.record_id AS "Record number",  
    last_checkin_gmt::date AS "Last checkin",  
    i.location_code AS "Location"  
FROM  
    sierra_view.item_record i;
```



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# WHERE: Introduction

```
SELECT
    i.record_id,
    last_checkin_gmt,
    i.location_code
FROM
    sierra_view.item_record i
WHERE i.location_code = 'dvdj';
```



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## WHERE: Equals and Not Equals

WHERE i.location\_code = 'dvdj'

WHERE i.checkout\_total = 0

WHERE i.location\_code <> 'dvdj'

WHERE i.checkout\_total <> 0

WHERE i.location\_code != 'dvdj'

WHERE i.checkout\_total != 0



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## WHERE: Greater Than, Less Than

WHERE i.location\_code > 'd'

WHERE i.checkout\_total > 0

WHERE i.location\_code >= 'd'

WHERE i.checkout\_total >= 0

WHERE i.location\_code < 'd'

WHERE i.checkout\_total < 1000

WHERE i.location\_code <= 'd'

WHERE i.checkout\_total <= 1000



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## WHERE: BETWEEN

WHERE o.volume\_count BETWEEN 1 AND 5;

WHERE b.title BETWEEN 'A' AND 'B';

WHERE UPPER(b.title) BETWEEN 'A' AND 'B';

WHERE LOWER(b.title) BETWEEN 'a' AND 'b';



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## WHERE: Dates

WHERE p.activity\_gmt > '1/31/2018'

WHERE p.activity\_gmt > '2018-1-31'

WHERE p.activity\_gmt BETWEEN '1/1/2017' AND  
'12/31/2017'

WHERE p.activity\_gmt > now() - interval '1 year'



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## WHERE: IN

```
WHERE o.material_type_code IN ('a', 'b', 'g');  
WHERE o.volume_count IN (1,2,7);
```



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## WHERE: LIKE, NOT LIKE

\_ (underscore) exactly one character

% zero or more characters (anything, or nothing)

WHERE LOWER(b.title) LIKE '%librar%';

WHERE b.title LIKE '\_';



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# WHERE: POSIX Regular Expressions

- `~` matches
- `~*` matches (not case sensitive)
- `!~` does not match
- `!~*` does not match (not case sensitive)

WHERE i.location\_code ~ '^j.\*'



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# ORDER BY

```
SELECT
    i.record_id,
    i.last_checkin_gmt,
    i.location_code
FROM
    sierra_view.item_record i
WHERE i.location_code = 'dvdj'
ORDER BY i.location_code,
    i.last_checkin_gmt DESC;
```



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# GROUP BY and COUNT

```
SELECT  
    i.id,  
    i.item_status_code  
FROM  
    sierra_view.item_view i  
WHERE  
    i.location_code = 'jpic';
```



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<b>id</b> <b>bigint</b>	<b>item_status_code</b> <b>character varying(3)</b>
450973125002	-
450972603170	m
450973024308	-
450972614775	-
450973197141	-
450973088494	-
450973178979	-
450973189931	-
450973197687	-
450973234627	-
450972594279	m
450972597532	m
450972949579	-
450973069468	-
450973119497	-



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# GROUP BY and COUNT()

```
SELECT
  COUNT(i.id),
  i.item_status_code
FROM
  sierra_view.item_view i
WHERE
  i.location_code = 'jpic'
GROUP BY
  i.item_status_code;
```



#IUG2019

count	item_status_code
bigint	character varying(3)
16	u
6	!
1	w
4	a
1	(
8094	-
99	n
4	z
26	\$
197	m
5	d
12	@



#IUG2019

# GROUP BY and AVG()

```
SELECT  
    i.location_code,  
    AVG(i.checkout_total)  
FROM  
    sierra_view.item_view i  
GROUP BY  
    i.location_code;
```



#IUG2019

location_code character varying(5)	avg numeric
jgrap	23.1386735572782084
largm	8.6666666666666667
csoun	29.7857142857142857
nwnon	2.4578447794528197
cdbkn	21.3684210526315789
dvdjn	34.9349593495934959
pbkn	7.9784172661870504
nwov	3.5572519083969466
cfoln	4.7857142857142857
cjazn	9.0869565217391304
cbkx	22.4453781512605042
rfatl	0.20000000000000000000
blusn	7.6666666666666667
ygrap	29.1884346959122632
plar	31.1666666666666667
..	..



#IUG2019

# GROUP BY and AVG and ROUND()

```
SELECT  
    i.location_code,  
    ROUND(AVG(i.checkout_total))  
FROM  
    sierra_view.item_view i  
GROUP BY  
    i.location_code;
```



#IUG2019

location_code character varying(5)	round numeric
jgrap	23
largm	9
csoun	30
nwnon	2
cdbkn	21
dvdjn	35
pbkn	8
nwov	4
cfoln	5
cjazn	9
cbkx	22
rfatl	0
blusn	8
ygrap	29
plar	31
..	..



#IUG2019

## ... and ORDER BY

```
SELECT
    i.location_code,
    ROUND(AVG(i.checkout_total))
FROM
    sierra_view.item_view i
GROUP BY
    i.location_code
ORDER BY ROUND(AVG(i.checkout_total)) DESC;
```



#IUG2019

location_code character varying(5)	round numeric
dvdt	104
dvde	92
dvds	61
cspok	57
dvdj	55
dvdf	54
bluj	53
jcd	45
crock	43
bluf	43
ccont	42
pvjn	41
dvdn	40
plyfi	38
pvj	38
...	...



#IUG2019

# HAVING

```
SELECT  
    COUNT(i.id),  
    i.item_status_code  
FROM  
    sierra_view.item_view i  
WHERE  
    i.location_code = 'jpic'  
GROUP BY  
    i.item_status_code  
HAVING COUNT(i.id) < 100;
```



#IUG2019

count bigint	item_status_code character varying(3)
13	!
17	u
3	a
8	@
1	(
92	n
3	z
2	\$
15	m
5	d



#IUG2019

# JOIN



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# The SQL (snippet)

```
FROM
  sierra_view.bib_view b
JOIN
  sierra_view.hold h
ON b.id = h.record_id;
```



#IUG2019

## How to Join Two Views

One table has to have the other table's ID number.

OR

A third table has to have the ID numbers of both tables.\*



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## How to Join Two Views - We'll look at:

- Sierra DNA (web site)
  - Detailed view
  - ERD view
- Top rows (in pgAdmin)



#IUG2019

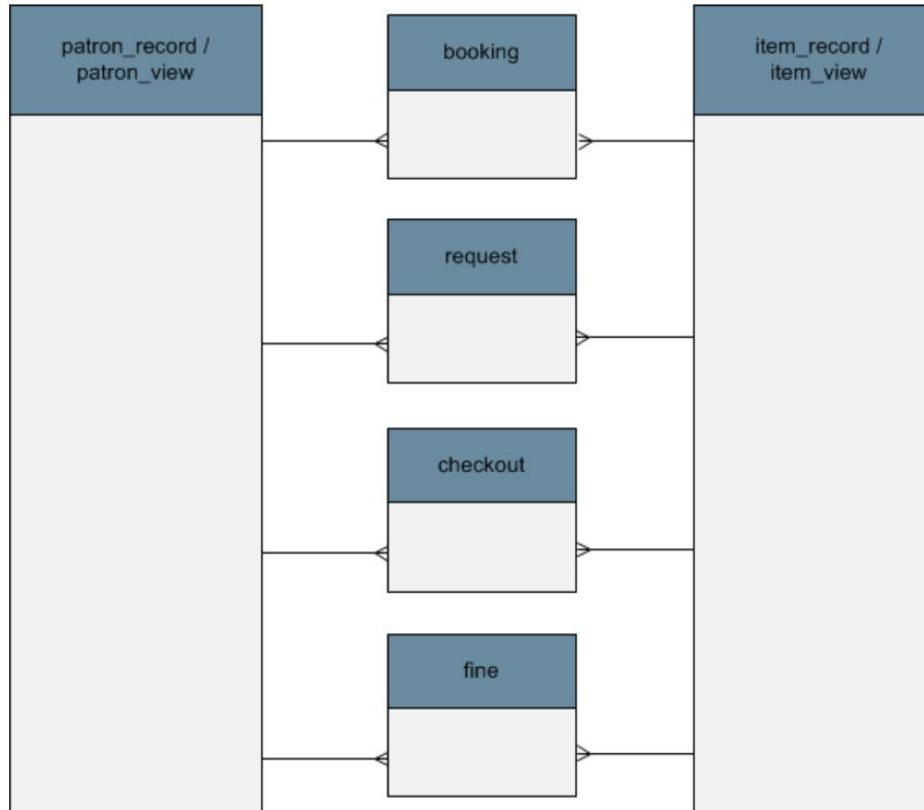
# Bibs with Bib-level Holds



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# Sierra DNA - ERD View



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# Sierra DNA - Detailed View for hold

## hold

Each row of hold describes a bibliographic, item, or volume hold.

Column	Data Type	Not NULL?	Comment
id	bigint	false	System-generated sequential ID.
patron_record_id	bigint	false	Foreign key to patron_record.
record_id	bigint	false	Foreign key to record.
placed_gmt	timestamp	false	Date the hold was placed.



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# Top Rows for bib\_view and hold

## Top rows for bib\_view and hold

Edit Data - Sierra DB (192.168.10.21:1032) - iii - sierra\_view.bib\_view

File Edit View Tools Help

100 rows

	<u><b>id</b></u> bigint	<u><b>record_type_code</b></u> character(1)	<u><b>record_num</b></u> integer	<u><b>language</b></u> character
<b>1</b>	420908065471	b	1270463	eng
<b>2</b>	420908172785	b	1377777	eng
<b>3</b>	420907795149	b	1000141	eng
<b>4</b>	420907795678	b	1000670	eng

Edit Data - Sierra DB (192.168.10.21:1032) - iii - sierra\_view.hold

File Edit View Tools Help

100 rows

	<u><b>id</b></u> bigint	<u><b>patron_record_id</b></u> bigint	<u><b>record_id</b></u> bigint	platin
<b>1</b>	483160	481037351623	3941100649441521	200
<b>2</b>	481974	481037468270	420908493552	200
<b>3</b>	486438	9852105222256298	450973194005	200
<b>4</b>	487101	3096705790300726	450973164331	200

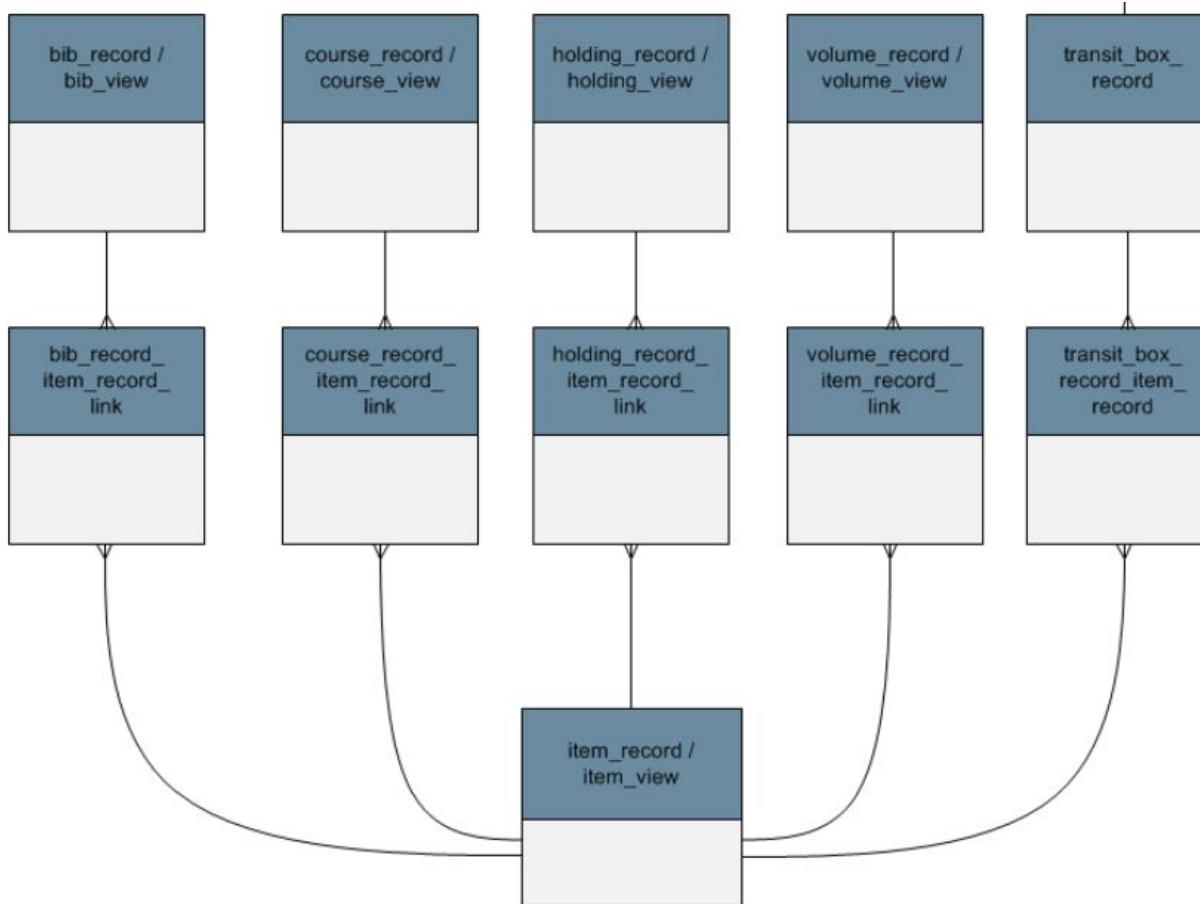
# Using JOIN with bib\_view and hold

```
SELECT  
    b.record_num,  
    h.id  
FROM  
    sierra_view.bib_view b  
JOIN  
    sierra_view.hold h  
ON b.id = h.record_id;
```



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# Sometimes There's a “Link” View



#IUG2019

# Sierra DNA

## bib\_record\_item\_record\_link

Each row of bib\_record\_item\_record\_link identifies a linked bibliographic and item record pair.

Column	Data Type	Not NULL?	Comment
id	bigint	false	System-generated sequential ID.
bib_record_id	bigint	false	Foreign key to bib_record.
item_record_id	bigint	false	Foreign key to item_record.
items_display_order	int	false	Integer to manage the display order of an items list.
bibs_display_order	int	false	Integer to manage the display order of a bibliographic record list.



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## Edit Data - Sierra DB (192.168.10.21:1032) - iii - sierra\_view.bib\_record\_item\_record\_link

File Edit View Tools Help



	<b>id</b> bigint	<b>bib_record_id</b> bigint	<b>item_record_id</b> bigint	<b>items_display_order</b> integer	<b>bibs_display_order</b> integer
<b>1</b>	110484	420908192612	450973016239	0	0
<b>2</b>	168664	420908268026	450973099199	0	0
<b>3</b>	326793	420908532670	450973209082		0
<b>4</b>	82	420908348172	450973129978	0	0
<b>5</b>	84	420908348197	450973128732	0	0
<b>6</b>	339059	30962668348043236	30962698412814308	0	0
<b>7</b>	246963	420908372871	450973159892		0
<b>8</b>	234485	5629920442032659	5629950506803731	0	0
<b>9</b>	246970	420908467025	450973159899		0
<b>10</b>	274415	420908487713	450973176058		0
<b>11</b>	326797	420908536452	450973209086		0
<b>12</b>	234490	1126320818405145	1126350883176217	0	0
<b>13</b>	314605	420908533437	450973201587		0

## JOIN Bib, link, and item

```
SELECT *
FROM
    sierra_view.bib_record b
JOIN
    sierra_view.bib_record_item_record_link L
    ON b.id = L.bib_record_id
JOIN
    sierra_view.item_record i
    ON i.id = L.item_record_id;
```



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# When to Use Different Kinds of JOIN

JOIN

LEFT JOIN



#IUG2019

# Example

```
SELECT  
    b.record_num,  
    b.title,  
    h.id  
FROM sierra_view.bib_view b  
JOIN sierra_view.hold h  
    ON h.record_id = b.id;
```



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Data Output		Explain	Messages	History	
	record_num integer	title character varying(1000)			id bigint
1	1000246	101 projects for woodworkers			26205474
2	1003779	The British invasion : the history of British rock, vol. 1.			29055315
3	1003885	Best-loved poems in large print			29071855
4	1004198	Book of patterns and instructions for American needlework : a complete manu			27358378
5	1005340	The Christmas book : a treasury of the sights, sounds, crafts, tastes & joy			26842004
6	1006432	Conflicts in feminism			25592732
7	1006593	Carl Jung and Christian spirituality			29031456
8	1007919	The Choices we made : 25 women and men speak out about abortion			29016297
9	1007919	The Choices we made : 25 women and men speak out about abortion			29016173
10	1008269	Death & dying : opposing viewpoints			23832885
11	1009876	Extraordinary lives : the art and craft of American biography			29057497
12	1010003	Encyclopedia of American cars, 1930-1980 : 50 years of automobile history			28892385
13	1010745	The Floating admiral			27826389
14	1010745	The Floating admiral			27548754
15	1012032	Fodor's Scandinavia.			28685946
16	1012032	Fodor's Scandinavia.			27675162



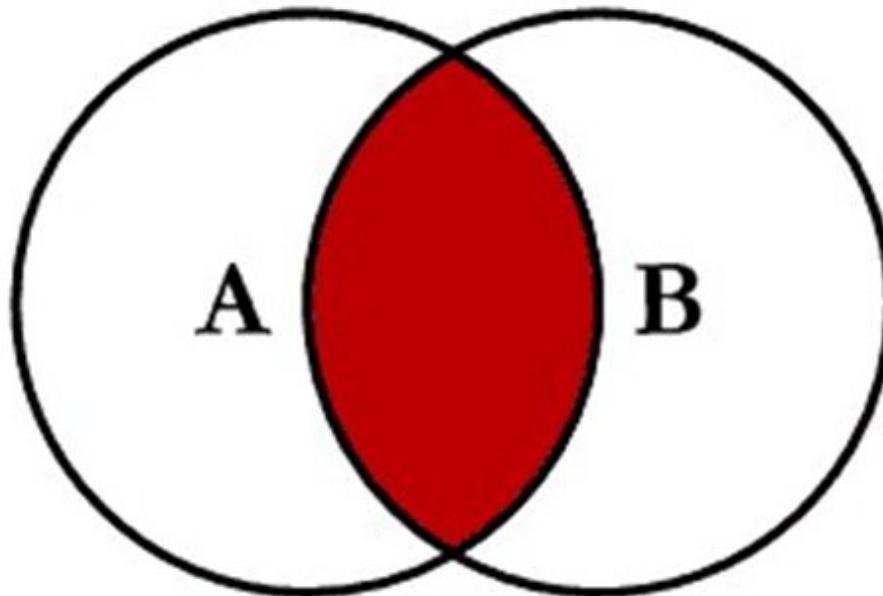
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This doesn't include bibs with zero bib-level holds.



#IUG2019

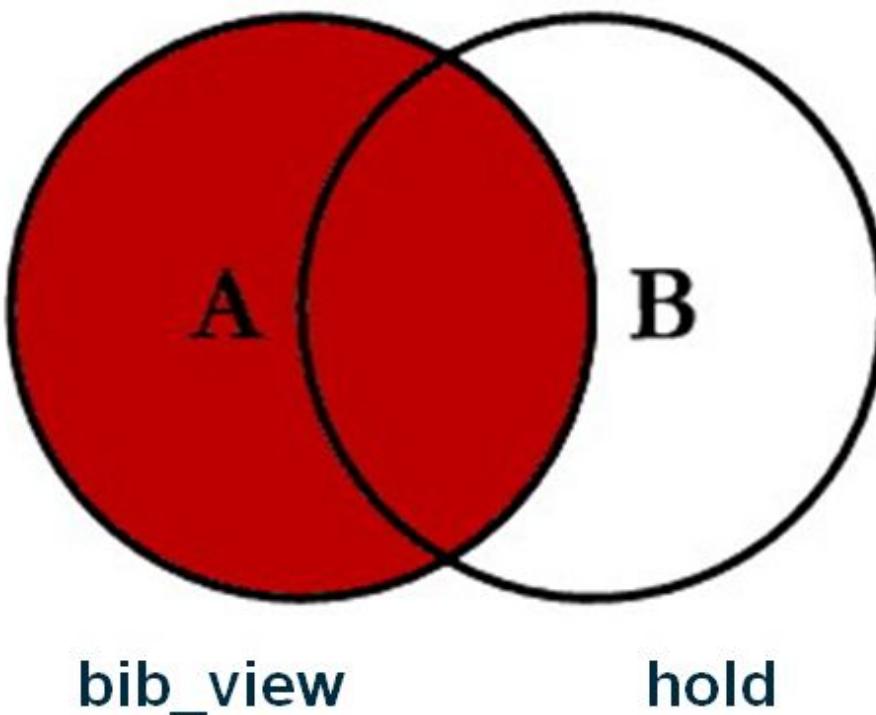
**JOIN (INNER JOIN):**  
**Bibs with title-level holds**



`bib_view`

`hold`

**LEFT JOIN (LEFT OUTER JOIN):**  
All bibs, some of which have title-level holds



# Include Bibs with No Bib-level Holds

```
SELECT  
    b.record_num,  
    b.title,  
    h.id  
FROM sierra_view.bib_view b  
LEFT JOIN sierra_view.hold h  
    ON h.record_id = b.id;
```



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# A Different Kind of Table

- varfield
- varfield\_view
- subfield
- subfield\_view



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## **varfield\_view: Each line has:**

- The content of a variable-length field
- The ID of the record it's from
- The kind of record it's from (b, i, p, etc.)
- The field tag
- The MARC tag and indicators



#IUG2019

## Edit Data - Sierra DB (192.168.10.21:1032) - iii - sierra\_view.varfield\_view

File Edit View Tools Help



100 rows

	<b>id</b> <b>bigint</b>	<b>record_id</b> <b>bigint</b>	<b>record_type_code</b> <b>character(1)</b>	<b>record_num</b> <b>integer</b>	<b>varfield_type_code</b> <b>character(1)</b>	<b>marc_tag</b> <b>character varying(3)</b>	<b>marc_ind1</b> <b>character(1)</b>	<b>marc_ind2</b> <b>character(1)</b>	<b>occ_num</b> <b>integer</b>	<b>field_content</b> <b>character varying(20001)</b>
74	554477	401007404117	p	1000900	x				2	Fri Jun 11 2010. Bill \$18.9
75	5994479	481037404117	p	1066965	x				3	Fri Jul 02 2010: Bill \$18.9
76	485202	420907795149	b	1000141	t	245	1	0	0	aCrooning : ba collection
77	485203	420907795149	b	1000141	r	300			0	a287 p.
78	485204	420907795149	b	1000141	c	092			0	a814 Dun
79	485205	420907795149	b	1000141	p	260			0	aNew York : bSimon and Sch
80	485206	420907795149	b	1000141	a	100	1		0	aDunne, John Gregory, d19
81	485207	420907795149	b	1000141	n	590			0	aDUNNE 363121 \$19.95
82	485208	420907795149	b	1000141	l	010			0	a90009404
83	485209	420907795149	b	1000141	y	005			0	19900105082902.2
84	485210	420907795149	b	1000141	y	040			1	aDLC cDLC
85	485211	420907795149	b	1000141	i	020			0	z0671672362
86	222097	450972975603	i	1409523	b				0	ITMPL004814752
87	222098	450972975603	i	1409523	p				0	CD ROCK
88	222099	450972975603	i	1409523	l				0	\$11.98 1CD 1/08
89	12399802	450973195937	i	1629857	b				0	ITMPL006179675
90	152297	450972914947	i	1348867	b				0	ITMPL004814828
91	152298	450972914947	i	1348867	p				0	J CD BOOK
92	152299	450972914947	i	1348867	l				0	\$90.00 17CD 7/05
93	152300	450972914947	i	1348867	m				0	17 cds.
94	152301	450972914947	i	1348867	x				0	RTI CLEANED ALL 17 DISCS
95	176	450972567054	i	1000974	b				0	ITMPL000650100
96	177	450972567054	i	1000974	a	947			0	aITMPL000650100 bMN cMYST

# Get MARC Field 245 for Bib Records

```
SELECT  
    b.record_num,  
    v.field_content  
FROM  
    sierra_view.bib_view b  
JOIN sierra_view.varfield_view v  
    ON (v.record_num = b.record_num  
    AND v.marc_tag = '245');
```



#IUG2019

## Output pane

Data Output Explain Messages History

	record_num integer	field_content character varying(20001)
1	1000113	aThe foxman / cby Gary Paulsen.
2	1000162	aSliver : ba novel / cIra Levin.
3	1756201	aNo room for small dreams : bcourage, imagination, and the making of modern Israel / cShimon Peres.
4	1000573	aRealms of fantasy / cMalcolm Edwards & Robert Holdstock.
5	1000682	aThe river bank : band other stories from the Wind in the willows / cKenneth Grahame ; illustrated by Inga
6	1623482	aClassical harp h[electronic resource] / cPatricia Spero.
7	1000410	aThe Christmas album h[sound recording].
8	1767558	aSoul / cJoey W. Hill.
9	1309072	aThe costume party / cstory and pictures by Victoria Chess.
10	1000519	aWashington County, Ohio, to 1980 : ba collection of topical & family sketches / cWashington County Historic



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## Two fields? Two JOINS to varfield\_view

```
JOIN sierra_view.varfield_view v1 ON (b.record_num =  
v1.record_num AND v1.marc_tag = '245')
```

```
JOIN sierra_view.varfield_view v2 ON (b.record_num =  
v2.record_num AND v2.marc_tag = '260')
```



#IUG2019

```
SELECT
    b.record_num AS "Bib#",
    v1.field_content AS "245",
    v2.field_content AS "260"
FROM
    sierra_view.bib_view b
JOIN sierra_view.varfield_view v1 ON (b.record_num =
v1.record_num AND v1.marc_tag = '245')
JOIN sierra_view.varfield_view v2 ON (b.record_num =
v2.record_num AND v2.marc_tag = '260');
```



#IUG2019

## Output pane

**Data Output** Explain Messages History

	Bib# integer	<b>245</b> <b>character varying(20001)</b>	<b>260</b> <b>character varying(20001)</b>
<b>1</b>	1000113	aThe foxman / cby Gary Paulsen.	aNew York : bPuffin Books, c1990.
<b>2</b>	1000162	aSliver : ba novel / cIra Levin.	aNew York : bBantam Books, c1991.
<b>3</b>	1000573	aRealms of fantasy / cMalcolm Edwards & Robert Holdstock.	aGarden City, N.Y. : bDoubleday, c1983.
<b>4</b>	1000682	aThe river bank : band other stories from the Wind in the Willows / cMalcolm Edwards & Robert Holdstock.	aCambridge, Massachusetts : bCandlewick Press, ccl1996.
<b>5</b>	1623482	aClassical harp h[electronic resource] / cPatricia Sturman.	aSuffolk, Eng. ; aBoulder, Colo. : bNew World Music, c2000.
<b>6</b>	1000410	aThe Christmas album h[sound recording].	a[S.l.] : bPhilips Digital Classics, cp1990.
<b>7</b>	1309072	aThe costume party / cstory and pictures by Victoria Kann.	aLa Jolla, CA : bKane/Miller, c2005.
<b>8</b>	1000519	aWashington County, Ohio, to 1980 : ba collection of historical documents.	a[Marietta] : bThe Society, cc1980.
<b>9</b>	1309664	aPeyton Place / cby Grace Metalious ; with a new introduction by Sue Grafton.	aBoston : bNortheastern University Press, c1999.
<b>10</b>	1559864	aThe lion and the bird / cMarianne Dubuc ; translated from the French by Jeanne L'Heureux.	aNew York : bEnchanted Lion Books, c2014.
<b>11</b>	1003075	aFamous kings & queens of England & Scotland / cby J. R. Green.	aNew York : bArco Pub. Co., ccl1977.
<b>12</b>	1004207	aHow to write a play / cby Raymond Hull.	aCincinnati, Ohio : bWriter's Digest Books, cc1983.
<b>13</b>	1007964	aMotor auto engines and electrical systems / ceditor John C. Hart.	aNew York : bMotor, cc1977.
<b>14</b>	1002074	aDances to Donafranc / cTeam Blaauw.	aNew York : bDutnam, c1982.



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# **What if you have a repeatable field?**



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```
SELECT
    v.field_content as "245",
    v2.field_content as "500"
FROM
    sierra_view.bib_view b
JOIN
    sierra_view.varfield_view v ON (b.record_num =
v.record_num and v.marc_tag = '245')
LEFT JOIN
    sierra_view.varfield_view v2 ON (b.record_num =
v2.record_num and v2.marc_tag = '500');
```



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**245****character varying(20001)**

aInvestigating your own back yard / cNatalie	aIncludes index.
aInvestigating your own back yard / cNatalie	a"N6157."
aInvestigating your own back yard / cNatalie	aTeacher guide - ask at desk. (Invest
aWhere's my jetpack? h[electronic resource] :	aDownloadable audio file.
aWhere's my jetpack? h[electronic resource] :	aTitle from: Title details screen.
aWhere's my jetpack? h[electronic resource] :	aUnabridged.
aWhere's my jetpack? h[electronic resource] :	aDuration: 3:41:05.
aAmerica 1941 : ba nation at the crossroads /	aIncludes index.
aAmerica 1941 : ba nation at the crossroads /	wnnnnc aPaige, Robin
aA ghoul's guide to love and murder / cVictor	a"An Obsidian mystery."
aPreschool prep. pCounting around the zoo.	aWidescreen (16x9)
aAn Americana Christmas h[sound recording].	aTitle from container.
aAn Americana Christmas h[sound recording].	aCompact disc.



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```
SELECT
    v.field_content as "245",
    v2.field_content as "500",
    v3.field_content as "700"
FROM
    sierra_view.bib_view b
JOIN
    sierra_view.varfield_view v on (b.record_num =
v.record_num and v.marc_tag = '245')
LEFT JOIN
    sierra_view.varfield_view v2 on (b.record_num =
v2.record_num and v2.marc_tag = '500')
LEFT JOIN
    sierra_view.varfield_view v3 on (b.record_num =
v3.record_num and v3.marc_tag = '700');
```



#IUG2019

245 character varying(20001)	500 character varying(20001)	700 character varying(20001)
aAnne of Green Gables h[videorec]	aBased on the novel by L.M.	aNicholls, George,  d1897-1939.
aAnne of Green Gables h[videorec]	aBased on the novel by L.M.	aMintz, Sam.
aAnne of Green Gables h[videorec]	aBased on the novel by L.M.	aShirley, Anne,  d1918-
aAnne of Green Gables h[videorec]	aBased on the novel by L.M.	aBrown, Tom,  d1913 Jan. 6-
aAnne of Green Gables h[videorec]	aBased on the novel by L.M.	aHeggie, O. P. q(Otto Peters),  d1876-1936
aAnne of Green Gables h[videorec]	aBased on the novel by L.M.	aMontgomery, L. M. q(Lucy Maud),  d1874-1964
aAnne of Green Gables h[videorec]	aOriginally released as a movie.	aNicholls, George,  d1897-1939.
aAnne of Green Gables h[videorec]	aOriginally released as a movie.	aMintz, Sam.
aAnne of Green Gables h[videorec]	aOriginally released as a movie.	aShirley, Anne,  d1918-
aAnne of Green Gables h[videorec]	aOriginally released as a movie.	aBrown, Tom,  d1913 Jan. 6-
aAnne of Green Gables h[videorec]	aOriginally released as a movie.	aHeggie, O. P. q(Otto Peters),  d1876-1936
aAnne of Green Gables h[videorec]	aOriginally released as a movie.	aMontgomery, L. M. q(Lucy Maud),  d1874-1964
aAnne of Green Gables h[videorec]	aFeatures: scene selections,	aNicholls, George,  d1897-1939.
aAnne of Green Gables h[videorec]	aFeatures: scene selections,	aMintz, Sam.
aAnne of Green Gables h[videorec]	aFeatures: scene selections,	aShirley, Anne,  d1918-
aAnne of Green Gables h[videorec]	aFeatures: scene selections,	aBrown, Tom,  d1913 Jan. 6-
aAnne of Green Gables h[videorec]	aFeatures: scene selections,	aHeggie, O. P. q(Otto Peters),  d1876-1936
aAnne of Green Gables h[videorec]	aFeatures: scene selections,	aMontgomery, L. M. q(Lucy Maud),  d1874-1964



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## If you want one line per title

Combine all 500 fields and all 700 files onto one line.

OR

Just get the first 500 field and the first 700 field.



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## All 500 fields and all 700 files onto one line

SELECT...

```
STRING_AGG(v.field_content, ';' order by occ_num) as  
"500"
```

...

```
GROUP BY v.field_content;
```



#IUG2019

```
SELECT
    v.field_content as "245",
    STRING_AGG(v2.field_content, ';' order by v2.occ_num) as "500",
    STRING_AGG(v3.field_content, ';' order by v3.occ_num) as "700"
FROM
    sierra_view.bib_view b
JOIN
    sierra_view.varfield_view v on (b.record_num =
v.record_num and v.marc_tag = '245')
LEFT JOIN
    sierra_view.varfield_view v2 on (b.record_num =
v2.record_num and v2.marc_tag = '500')
LEFT JOIN
    sierra_view.varfield_view v3 on (b.record_num =
v3.record_num and v3.marc_tag = '700')
GROUP BY v.field_content;
```



#IUG2019

245 character varying(20001)	500 text	700 text
aAnne of Green Gables h[videorec]	aBased on the novel by L.M. Montgome	aNicholls, George,  d1897-1939.;  aN



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# Only the first 500 field and the first 700

This requires a subquery



#IUG2019

# The Way We Did it Earlier

```
SELECT  
    b.record_num,  
    v.field_content  
FROM  
    sierra_view.bib_view b  
JOIN sierra_view.varfield_view v  
    ON (v.record_num = b.record_num  
    AND v.marc_tag = '500');
```



#IUG2019

# Using a Subquery

SELECT

```
b.record_num,  
(SELECT field_content AS b500  
FROM sierra_view.varfield_view v  
WHERE b.id = v.record_id AND v.marc_tag = '500'  
LIMIT 1)
```

FROM

```
sierra_view.bib_view b;
```



#IUG2019

```
SELECT
    b.record_num,
    (SELECT field_content AS b500
        FROM sierra_view.varfield_view v
       WHERE b.id = v.record_id AND v.marc_tag = '500'
         LIMIT 1),
    (SELECT field_content AS b700
        FROM sierra_view.varfield_view v2
       WHERE b.id = v2.record_id AND v2.marc_tag = '700'
         LIMIT 1)
  FROM
    sierra_view.bib_view b;
```



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# Consider Attending

- Automating Booklist Curation with SQL
  - Tuesday 1:30-2:30 Deer Valley
- Cache and Release: Capturing and Using Sierra's Temporary SQL Data
  - Wednesday 3:00-4:00 Deer Valley
- SQL Hangout (Birds of A Feather)



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## Find Us On Slack

All three of us can be found on the Sierra\_ILS slack workspace, run by Craig Bowman



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# Questions?

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