

HW#05 Updated ISTE230	<b>RIT</b>   Golisano College of Computing and Information Sciences <b>School of Information</b>	Fall 2022
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Homework #05

Start of class  
Due Thursday October 20, 2022 @ 11:59pm

Name: \_\_\_\_\_ (Lastname, Firstname)

## Homework #5: Relational Algebra, Subqueries, Joins, Unions, Intersections and differences

Note: submissions must be made to the appropriate dropbox – see below.

In this lab you will utilize the JOBS database to explore the use of relational algebra, subqueries, and joins within MySQL. This exploration will help you to formulate strategies for query composition when a specified set of data needs to be found within a database.

### Download and install the JOBS database

In my Courses section - Script files SOURCE download the file **createJOBSv3.sql**  
Run the script file

Familiarize yourself with the structure of the **TEST** database by examining the 'createJOBSv3.sql' script as well as reviewing the information provided in appendix A.

### Query the database

For each of the tasks that follow you will write a SQL statement that will answer the question given the specifications provided. The results you should achieve are shown after each task (if your records appear in a different order but the content is the same, that is fine). The SQL statements for ALL questions should be placed in **one script** that follows the format '*yourlastname\_HW5.sql*'. After your script file is error free and you have the MySQL –VERBOSE option on, create a tee file *yourlastname\_HW5.txt*. Run your script file once this tee file is open.

### Submitting your work

To get credit for this homework you will need to upload your script file and log (TEE) file to the ASSIGNMENT drop box HW#5. The deadline for submission is given at the top of this handout. Please don't put them in a zip file.

### Homework #5

1. Write a SQL statement that will UNION the following two queries together using the UNION keyword:

- Show the companyname, division, and listing for those interviews where a listing was posted (indicated by a 'y').
- Show the companyname, division, and listing for those interviews where a listing was not posted (indicated by a 'n').

companyname	division	listing
Braddock Information Assoc.	Payroll	n
Vegas Programming and Design	Development	n
Cameron Industries	Management	n
Cameron Industries	Customer Support	n
CCC Software	Production	n
DC Security Applications	RandD	n
Davis-Klein Software	RandD	n
Flordia Software Designs	RandD	n
Rochester Software Design	Development	n
Jersey Computer Services	Customer Support	n
Flordia Software Designs	Development	n
Sandy Shore Software	Development	n
Virginia Software Industries	Production	n
Acme Information Source	Customer Support	y
Ajax Software, Inc.	Production	y
Ajax Software, Inc.	RandD	y
Bay Software Inc.	Production	y
Mountainside Magic Software	Management	y
Mountainside Magic Software	Customer Support	y
Focused Applications, Inc.	Production	y
Georgia Software Design	RandD	y
ApplDesign	RandD	y
Long Island Apps, Inc.	Development	y
Manhattan-Made Software	Customer Support	y
Manhattan-Made Software	Payroll	y
Nantucket Applications, Inc.	RandD	y
PennState Programming, Inc.	Management	y
Buffalo Software Assoc.	Payroll	y

28 rows in set (0.03 sec)

### Homework #5

- Write a SQL INNER JOIN statement that will accomplish an intersection between the employer and the interview tables. Display the companyname, division, and statecode attributes from the employer table. (Hint: Make sure you are joining on the **ENTIRE PRIMARY** key/foreign key relationship.)

companyname	division	statecode
Acme Information Source	Customer Support	OH
Ajax Software, Inc.	Production	CA
Ajax Software, Inc.	RandD	CA
ApplDesign	RandD	AL
Bay Software Inc.	Production	CA
Braddock Information Assoc.	Payroll	MA
Buffalo Software Assoc.	Payroll	NY
Cameron Industries	Customer Support	TX
Cameron Industries	Management	TX
CCC Software	Production	NY
Davis-Klein Software	RandD	NY
DC Security Applications	RandD	VA
Flordia Software Designs	Development	FL
Flordia Software Designs	RandD	FL
Focused Applications, Inc.	Production	SC
Georgia Software Design	RandD	GA
Jersey Computer Services	Customer Support	NJ
Long Island Apps, Inc.	Development	NY
Manhattan-Made Software	Customer Support	NY
Manhattan-Made Software	Payroll	NY
Mountainside Magic Software	Customer Support	CO
Mountainside Magic Software	Management	CO
Nantucket Applications, Inc.	RandD	MA
PennState Programming, Inc.	Management	PA
Rochester Software Design	Development	NY
Sandy Shore Software	Development	CT
Vegas Programming and Design	Development	NV
Virginia Software Industries	Production	VA

28 rows in set (0.00 sec)

### Homework #5

3. Write a SQL statement that accomplishes a difference between the state and employer tables (STATE-EMPLOYER).

statecode	description
AK	ALASKA
AR	ARKANSAS
AS	AMERICAN SAMOA
AZ	ARIZONA
DC	DISTRICT OF COLUMBIA
DE	DELAWARE
FM	FEDERATED STATES OF MICRONESIA
GU	GUAM
HI	HAWAII
IA	IOWA
ID	IDAHO
IL	ILLINOIS
IN	INDIANA
KS	KANSAS
KY	KENTUCKY
LA	LOUISIANA
MD	MARYLAND
ME	MAINE
MH	MARSHALL ISLANDS
MN	MINNESOTA
MO	MISSOURI
MP	NORTHERN MARIANA ISLANDS
MS	MISSISSIPPI
MT	MONTANA
NC	NORTH CAROLINA
ND	NORTH DAKOTA
NE	NEBRASKA
NH	NEW HAMPSHIRE
NM	NEW MEXICO
OK	OKLAHOMA
OR	OREGON
PR	PUERTO RICO
PW	PALAU
RI	RHODE ISLAND
SD	SOUTH DAKOTA
TN	TENNESSEE
UT	UTAH
VI	VIRGIN ISLANDS
VT	VERMONT
WA	WASHINGTON
WI	WISCONSIN
WV	WEST VIRGINIA
WY	WYOMING

43 rows in set (0.00 sec)

### Homework #5

4. Write a SQL statement that does a projection of the location and qtrcode attributes of the quarter table.

location	qtrcode
CA	20193
MA	20203
NY	20191
NY	20201
NY	20204

5 rows in set (0.00 sec)

5. Write a SQL statement that does a selection from the quarter table showing the quarters 20201 and 20204 only. Please use the IN operator

qtrCode	location	minSal	minHrs
20201	NY	22.25	30
20204	NY	23.75	40

2 rows in set (0.00 sec)

## Homework #5

6. Write a SQL statement that will show the companyname, statecode, and full state name for each employer.

companyname	statecode	description
ApplDesign	AL	ALABAMA
Ajax Software, Inc.	CA	CALIFORNIA
Ajax Software, Inc.	CA	CALIFORNIA
Bay Software Inc.	CA	CALIFORNIA
Bay Software Inc.	CA	CALIFORNIA
Mountainside Magic Software	CO	COLORADO
Mountainside Magic Software	CO	COLORADO
Sandy Hook Software	CT	CONNECTICUT
Flordia Software Designs	FL	FLORIDA
Flordia Software Designs	FL	FLORIDA
Georgia Software Design	GA	GEORGIA
Braddock Information Assoc.	MA	MASSACHUSETTS
Nantucket Applications, Inc.	MA	MASSACHUSETTS
Michigan Application Design	MI	MICHIGAN
Jersey Computer Services	NJ	NEW JERSEY
Vegas Programming and Design	NV	NEVADA
Buffalo Software Assoc.	NY	NEW YORK
CCC Software	NY	NEW YORK
Davis-Klein Software	NY	NEW YORK
Long Island Apps, Inc.	NY	NEW YORK
Manhattan-Made Software	NY	NEW YORK
Manhattan-Made Software	NY	NEW YORK
Midtown Software Development	NY	NEW YORK
Rochester Application Software	NY	NEW YORK
Rochester Software Design	NY	NEW YORK
Western New York Applications	NY	NEW YORK
Yankee Software	NY	NEW YORK
Yankee Software	NY	NEW YORK
Yankee Software	NY	NEW YORK
Acme Information Source	OH	OHIO
PennState Programming, Inc.	PA	PENNSYLVANIA
PSWD, Inc.	PA	PENNSYLVANIA
Focused Applications, Inc.	SC	SOUTH CAROLINA
Cameron Industries	TX	TEXAS
Cameron Industries	TX	TEXAS
DC Security Applications	VA	VIRGINIA
Virginia Software Industries	VA	VIRGINIA

37 rows in set (0.00 sec)

## Homework #5

7. Write a SQL statement that will show the descriptions for ALL states as well as the company names of employers located each state.

description	companyname
ALASKA	NULL
ALABAMA	ApplDesign
ARKANSAS	NULL
AMERICAN SAMOA	NULL
ARIZONA	NULL
CALIFORNIA	Ajax Software, Inc.
CALIFORNIA	Ajax Software, Inc.
CALIFORNIA	Bay Software Inc.
CALIFORNIA	Bay Software Inc.
COLORADO	Mountainside Magic Software
COLORADO	Mountainside Magic Software
CONNECTICUT	Sandy Hook Software
DISTRICT OF COLUMBIA	NULL
DELAWARE	NULL
FLORIDA	Flordia Software Designs
FLORIDA	Flordia Software Designs
FEDERATED STATES OF MICRONESIA	NULL
GEORGIA	Georgia Software Design
GUAM	NULL
HAWAII	NULL
IOWA	NULL
IDAHO	NULL
ILLINOIS	NULL
INDIANA	NULL
KANSAS	NULL
KENTUCKY	NULL
LOUISIANA	NULL
MASSACHUSETTS	Braddock Information Assoc.
MASSACHUSETTS	Nantucket Applications, Inc.
MARYLAND	NULL
MAINE	NULL
MARSHALL ISLANDS	NULL
MICHIGAN	Michigan Application Design
MINNESOTA	NULL
MISSOURI	NULL
NORTHERN MARIANA ISLANDS	NULL
MISSISSIPPI	NULL
MONTANA	NULL
NORTH CAROLINA	NULL
NORTH DAKOTA	NULL
NEBRASKA	NULL
NEW HAMPSHIRE	NULL
NEW JERSEY	Jersey Computer Services
NEW MEXICO	NULL
NEVADA	Vegas Programming and Design
NEW YORK	Buffalo Software Assoc.
NEW YORK	CCC Software
NEW YORK	Davis-Klein Software
NEW YORK	Long Island Apps, Inc.
NEW YORK	Manhattan-Made Software
NEW YORK	Manhattan-Made Software
NEW YORK	Midtown Software Development
NEW YORK	Rochester Application Software
NEW YORK	Rochester Software Design
NEW YORK	Western New York Applications
NEW YORK	Yankee Software
NEW YORK	Yankee Software
NEW YORK	Yankee Software
OHIO	Acme Information Source

## Homework #5

OKLAHOMA	NULL
OREGON	NULL
PENNSYLVANIA	PennState Programming, Inc.
PENNSYLVANIA	PSWD, Inc.
PUERTO RICO	NULL
PALAU	NULL
RHODE ISLAND	NULL
SOUTH CAROLINA	Focused Applications, Inc.
SOUTH DAKOTA	NULL
TENNESSEE	NULL
TEXAS	Cameron Industries
TEXAS	Cameron Industries
UTAH	NULL
VIRGINIA	DC Security Applications
VIRGINIA	Virginia Software Industries
VIRGIN ISLANDS	NULL
VERMONT	NULL
WASHINGTON	NULL
WISCONSIN	NULL
WEST VIRGINIA	NULL
WYOMING	NULL

80 rows in set (0.00 sec)



## Homework #5

### Appendix A – Information on JOBS database structure and content

```
mysql> DESCRIBE employer;
```

Field	Type	Null	Key	Default	Extra
companyname	varchar(30)		PRI		
division	varchar(30)		PRI		
address	varchar(30)	YES		NULL	
city	varchar(20)	YES		NULL	
statecode	char(2)	YES		NULL	
zipcode	int(5)	YES		NULL	

```
6 rows in set (0.00 sec)
```

```
mysql> DESCRIBE interview;
```

Field	Type	Null	Key	Default	Extra
interviewID	int(11)		PRI	0	
interviewdate	date	YES		NULL	
companyname	varchar(30)	YES		NULL	
division	varchar(30)	YES		NULL	
qtrcode	varchar(5)	YES		NULL	
salaryoffered	float(8,2)	YES		NULL	
minhrsoffered	int(2)	YES		NULL	
listing	char(1)	YES		NULL	
jobdesc	varchar(255)	YES		NULL	

```
9 rows in set (0.00 sec)
```

```
mysql> DESCRIBE quarter;
```

Field	Type	Null	Key	Default	Extra
qtrcode	varchar(5)		PRI		
location	char(2)	YES		NULL	
minsal	float(6,2)			0.00	
minhrs	int(2)			0	

```
4 rows in set (0.00 sec)
```

```
mysql> DESCRIBE state;
```

Field	Type	Null	Key	Default	Extra
statecode	char(2)		PRI		
description	varchar(30)				

```
2 rows in set (0.00 sec) mysql>
```

## Homework #5

```
mysql> SELECT * FROM employer;
```

37 rows in set (0.00 sec)

companyname	division	address	city	statecode	zipcode
Acme Information Source	Customer Support	132 Commerical Way	Cleveland	OH	44234
Ajax Software, Inc.	RandD	2421 West Industrial Way	Berkeley	CA	94710
Ajax Software, Inc.	Production	2421 West Industrial Way	Berkeley	CA	94710
Bay Software Inc.	Production	4223 Halster Way	Berkeley	CA	94710
Bay Software Inc.	RandD	4223 Halster Way	Berkeley	CA	94710
Braddock Information Assoc.	Payroll	1 Washington Complex	Boston	MA	2101
Yankee Software	Development	1 Braddock Circle	Kenmore	NY	14223
Yankee Software	RandD	1 Braddock Circle	Kenmore	NY	14223
Yankee Software	Management	1 Braddock Circle	Kenmore	NY	14223
Buffalo Software Assoc.	Payroll	45511 Delaware Ave.	Buffalo	NY	14221
Cameron Industries	Management	3112 West Helm Street	Kingwood	TX	77339
Cameron Industries	Customer Support	3112 West Helm Street	Kingwood	TX	77339
CCC Software	Production	41 Golem Terrace	New York	NY	10012
DC Security Applications	RandD	1602 Jackson Ave.	Arlington	VA	22202
Davis-Klein Software	RandD	8871 West Grange Drive	Cairo	NY	12413
Jersey Computer Services	Customer Support	44 WhiteStallion Pike	Lindenwold	NJ	8021
Flordia Software Designs	Development	45A Sturgeon Dr., Bldg. 5	Ft. Pierce	FL	34951
Flordia Software Designs	RandD	45A Sturgeon Dr., Bldg. 5	Ft. Pierce	FL	34951
Focused Applications, Inc.	Production	776 West Ninth St.	Myrtle Beach	SC	29579
Georgia Software Design	RandD	6665 Peachtree Lane	Atlanta	GA	30328
ApplDesign	RandD	3 Mapleview Drive	Huntsville	AL	35803
Long Island Apps, Inc.	Development	67 Merrifield Ave.	Oceanside	NY	11572
Manhattan-Made Software	Customer Support	35 West 9th St.	New York	NY	10012
Manhattan-Made Software	Payroll	35 West 9th St.	New York	NY	10012
Michigan Application Design	Development	5531 E. Lansing Ave.	Ypsilanti	MI	48197
Midtown Software Development	Customer Support	7554 West 9th St.	New York	NY	10003
Mountainside Magic Software	Customer Support	4 Rocky Way	Colorado Springs	CO	80941
Mountainside Magic Software	Management	4 Rocky Way	Colorado Springs	CO	80941
Nantucket Applications, Inc.	RandD	45521 Pilgrim Circle	Nantucket	MA	2554
PennState Programming, Inc.	Management	3 Carnegie Circle	Pittsburgh	PA	15108
PSWD, Inc.	Management	15 Carnegie Circle	Pittsburgh	PA	15108
Rochester Software Design	Development	16 Broad Street	Rochester	NY	14621
Rochester Application Software	Production	16 Broad Street	Rochester	NY	14621
Sandy Hook Software	Development	5665 MassPike Circle	Sandy Hook	CT	6482
Vegas Programming and Design	Development	3 Desert Trail	Las Vegas	NV	89117
Virginia Software Industries	Production	3 Confederate Ave.	Roanoke	VA	24010
Western New York Applications	RandD	44 Rockman Blvd.	Rochester	NY	14623

## Homework #5

```
mysql> SELECT interviewID "ID", interviewdate "Date",
->    Companyname, division, qtrcode "Qtr.", salaryoffered "$ offer",
->    minhrsoffered "Hrs.", listing "List?", jobdesc
->    FROM interview;
```

ID	Date	Companyname	division	Qtr.	\$ offer	Hrs.	List?	jobdesc
1	1995-06-01	Acme Information Source	Customer Support	19951	12.00	40	y	Job Desc
2	1995-06-01	Braddock Information Assoc.	Payroll	19951	10.75	40	n	Job Desc
3	1995-06-30	Ajax Software, Inc.	Production	19951	11.00	40	y	Job Desc
4	1995-06-30	Ajax Software, Inc.	RandD	19951	11.50	40	y	Job Desc
5	1995-07-01	Bay Software Inc.	Production	19951	11.75	20	y	Job Desc
6	1995-08-01	Vegas Programming and Design	Development	19951	11.00	40	n	Job Desc
7	1995-08-01	Mountainside Magic Software	Management	19951	11.50	20	y	Job Desc
8	1995-08-02	Mountainside Magic Software	Customer Support	19951	10.75	40	y	Job Desc
9	1995-12-01	Cameron Industries	Management	19953	13.25	35	n	Job Desc
10	1995-12-02	Cameron Industries	Customer Support	19953	13.00	35	n	Job Desc
11	1995-12-04	CCC Software	Production	19953	11.50	40	n	Job Desc
12	1996-01-21	DC Security Applications	RandD	19953	11.50	30	n	Job Desc
13	1996-02-01	Davis-Klein Software	RandD	19953	11.25	20	n	Job Desc
14	1996-02-02	Flordia Software Designs	RandD	19953	11.75	30	n	Job Desc
15	1996-07-01	Rochester Software Design	Development	19961	12.00	30	n	Job Desc
16	1996-07-01	Focused Applications, Inc.	Production	19961	12.00	30	y	Job Desc
17	1996-08-01	Georgia Software Design	RandD	19961	11.75	40	y	Job Desc
18	1996-08-08	ApplDesign	RandD	19961	11.50	30	y	Job Desc
19	1996-08-11	Long Island Apps, Inc.	Development	19961	12.25	40	y	Job Desc
20	1997-01-01	Jersey Computer Services	Customer Support	19963	12.50	35	n	Job Desc
21	1997-01-01	Flordia Software Designs	Development	19963	12.75	30	n	Job Desc
22	1997-01-31	Manhattan-Made Software	Customer Support	19963	12.50	40	y	Job Desc
23	1997-02-01	Manhattan-Made Software	Payroll	19963	13.25	40	y	Job Desc
24	1997-03-24	Nantucket Applications, Inc.	RandD	19964	13.00	40	y	Job Desc
25	1997-03-31	PennState Programming, Inc.	Management	19964	13.00	40	y	Job Desc
26	1997-04-20	Sandy Hook Software	Development	19964	12.75	35	n	Job Desc
27	1997-04-22	Buffalo Software Assoc.	Payroll	19964	12.75	35	y	Job Desc
28	1997-05-01	Virginia Software Industries	Production	19964	13.75	40	n	Job Desc

28 rows in set (0.00 sec)

```
mysql> SELECT * FROM state;
```

statecode	description
AL	ALABAMA
AK	ALASKA
AS	AMERICAN SAMOA
AZ	ARIZONA
AR	ARKANSAS
CA	CALIFORNIA
CO	COLORADO
CT	CONNECTICUT
DE	DELAWARE
DC	DISTRICT OF COLUMBIA
FM	FEDERATED STATES OF MICRONESIA
FL	FLORIDA
GA	GEORGIA
GU	GUAM
HI	HAWAII
ID	IDAHO
IL	ILLINOIS
IN	INDIANA
IA	IOWA
KS	KANSAS
KY	KENTUCKY
LA	LOUISIANA
ME	MAINE
MH	MARSHALL ISLANDS
MD	MARYLAND
MA	MASSACHUSETTS
MI	MICHIGAN
MN	MINNESOTA
MS	MISSISSIPPI
MO	MISSOURI
MT	MONTANA
NE	NEBRASKA
NV	NEVADA
NH	NEW HAMPSHIRE
NJ	NEW JERSEY
NM	NEW MEXICO
NY	NEW YORK
NC	NORTH CAROLINA
ND	NORTH DAKOTA
MP	NORTHERN MARIANA ISLANDS
OH	OHIO
OK	OKLAHOMA
OR	OREGON
PW	PALAU
PA	PENNSYLVANIA
PR	PUERTO RICO
RI	RHODE ISLAND
SC	SOUTH CAROLINA
SD	SOUTH DAKOTA
TN	TENNESSEE
TX	TEXAS
UT	UTAH

VT	VERMONT
VI	VIRGIN ISLANDS
VA	VIRGINIA
WA	WASHINGTON
WV	WEST VIRGINIA
WI	WISCONSIN
WY	WYOMING

59 rows in set (0.00 sec)

```
mysql> SELECT * FROM quarter;
```

qtrcode	location	minsal	minhrs
19951	NY	11.00	40
19953	CA	11.50	30
19961	NY	12.00	30
19963	MA	12.75	40
19964	NY	13.50	40

5 rows in set (0.0