


3 Database Queries

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- Mandatory: Chapter 4 – Sections 4.6 & 4.7

Reading Assignment

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- Can be found on:

<http://pages.cpsc.ucalgary.ca/~kawash/peeking.html>

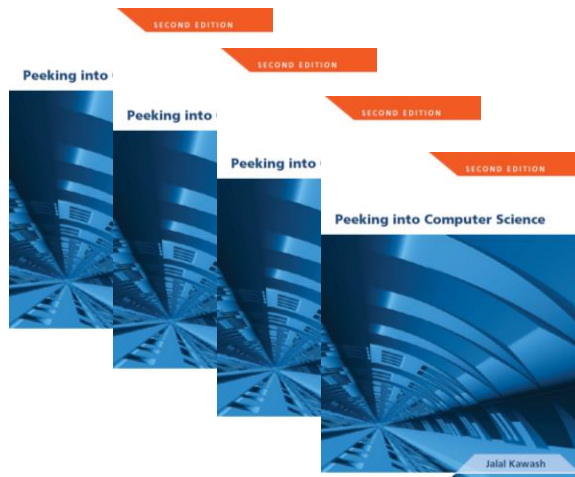
- Includes all examples in the book
 - Numbered by exercise numbers

Example Access DB

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Structured Query Language

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By the end of this section, you will be able to:

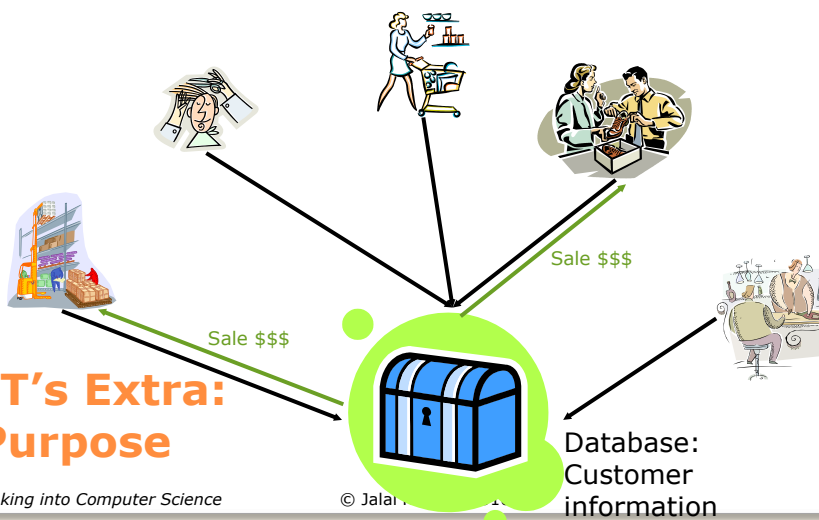
1. Name the two parts of SQL
2. Understand the function of each part
3. Formulate basic DDL & DML statements in SQL

Objectives

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- To store & retrieve information



JT's Extra: Purpose

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- Queries are questions 'asked' of/to the database in order to retrieve information.

The left screenshot shows a Bing search for "What is the answer to life, the universe and everything?". The search bar contains the text, and the results show a link to a Wikipedia article titled "42 (number) - Wikipedia".

The right screenshot shows a Bing search for "james tam". The search bar contains the text, and the results show a link to a faculty home page for James Tam at the University of Calgary.

JT's Extra: Queries

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- Data retrieval occurs through the use of 'queries':
 - A query is a question asked of the data in the database.
 - Typically worded to show only the parts of the database for which the answer to the question is true.
 - **Example 1:** What is the SIN, name and pay rate of every employee in the Employees Table:

Employee Pay Rates : Select Query				
	SIN	LastName	FirstName	PayRate
▶	123 415 322	Simcox	Cole	30
	123 456 789	Smith	John	20
	371 988 812	Carswell	Mary	30
	413 754 621	Kennedy	Leon	30
	444 638 047	Redfield	Claire	35

- **Example 2:** What employees have the last name of Morris?
Query

Field:	SIN	LastName	FirstName	Address
Tables:	Employees	Employees	Employees	Employees
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		"Morris"		
or:				

JT's Extra: Retrieving Data Via Queries

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- SQL JT's Extra: SQL = **Structured Query Language**
- Programming language, specialized for databases
- Data Definition Language (DDL)
 - Defining the structure of the DB

JT's Extra: Creating the data (table)

 - What fields?
 - What will each field store?
- Data Manipulation Language (DML)
 - Manipulating the contents of the DB

JT's Extra: Modifying the data (table)

 - Insertions
 - Deletions



Structured Query Language

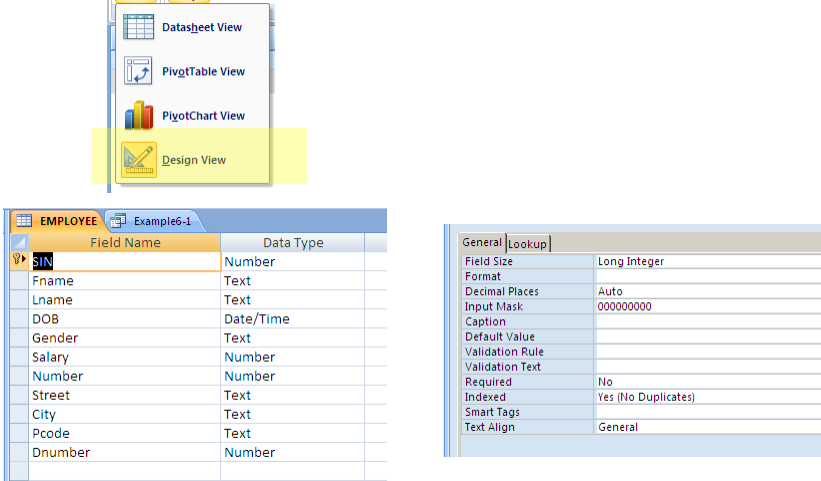
```

CREATE TABLE EMPLOYEE
(
  SIN          CHAR (9) ,
  Fname       CHAR (15) ,
  Lname       CHAR (15) ,
  DOB         DATE,
  Gender      CHAR (6) ,
  Salary      NUMBER,
  Street      CHAR (30) ,
  City        CHAR (15) ,
  Pcode       CHAR (7) ,
  Dnumber    NUMBER
)

```



DDL



The screenshot displays the Microsoft Access interface. At the top, a menu shows four view options: Datasheet View, PivotTable View, PivotChart View, and Design View. Below this, the 'EMPLOYEE' table is shown in Design View. The table structure is as follows:

Field Name	Data Type
SIN	Number
Fname	Text
Lname	Text
DOB	Date/Time
Gender	Text
Salary	Number
Number	Number
Street	Text
City	Text
Pcode	Text
Dnumber	Number

To the right, the 'General' tab of the Properties window is shown, with the following settings:

Property	Value
Field Size	Long Integer
Format	
Decimal Places	Auto
Input Mask	000000000
Caption	
Default Value	
Validation Rule	
Validation Text	
Required	No
Indexed	Yes (No Duplicates)
Smart Tags	
Text Align	General

Access Table Creation

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Recall: Data manipulation language modifies the tables

General format:

- `<Action> into/from <Table name>`

Example:

- `Insert into Employees {some values}`
- `Delete from Employees {conditions for deletion }`

JT's Extra: DML General Structure

INSERT INTO EMPLOYEE VALUES

(171717171, 'Debra', 'Beacon', '15-Aug-1961', 'Female', 70000, 15, 'Baron Hill', 'Calgary', 'T2X Y0Y', 1)

INSERT INTO EMPLOYEE VALUES

(181817178, 'Sam', 'Field', '17-Feb-1978', 'Male', 40000, 15, 'Kick Way', 'Calgary', 'Y2K K0K', 1)

INSERT INTO EMPLOYEE VALUES

(123456789, 'Rajet', 'Folk', '30-Apr-1967', 'Male', 78000, 123, 'One Road', 'Toronto', 'H1H J9J', 2)

INSERT INTO EMPLOYEE VALUES

(987654321, 'Marie', 'Band', '12-Jan-1985', 'Female', 53500, 2828, 'Exit Close', 'Toronto', 'K8O O8K', 2)

INSERT INTO EMPLOYEE VALUES

(666333999, 'Saleh', 'Dice', '25-Mar-1970', 'Male', 90400, 66, 'Straight Way', 'Toronto', 'T4E T6B', 1)

EMPLOYEE

SIN	Fname	Lname	DOB	Gender	Salary	Number	Street	City	Peode	Dnumber
171717171	Debra	Beacon	15-Aug-1961	Female	70000	15	Baron Hill	Calgary	T2X Y0Y	1
181817178	Sam	Field	17-Feb-1978	Male	40000	15	Kick Way	Calgary	Y2K K0K	1
123456789	Rajet	Folk	30-Apr-1967	Male	78000	123	One Road	Toronto	H1H J9J	2
987654321	Marie	Band	12-Jan-1985	Female	53500	2828	Exit Close	Toronto	K8O O8K	2
666333999	Saleh	Dice	25-Mar-1970	Male	90400	66	Straight Way	Toronto	T4E T6B	3



DML - Insertion

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DELETE FROM EMPLOYEE**WHERE** Gender = 'Male'**EMPLOYEE**

SIN	Fname	Lname	DOB	Gender	Salary	Number	Street	City	Peode	Dnumber
171717171	Debra	Beacon	15-Aug-1961	Female	70000	15	Baron Hill	Calgary	T2X Y0Y	1
181817178	Sam	Field	17-Feb-1978	Male	40000	15	Kick Way	Calgary	Y2K K0K	1
123456789	Rajet	Folk	30-Apr-1967	Male	78000	123	One Road	Toronto	H1H J9J	2
987654321	Marie	Band	12-Jan-1985	Female	53500	2828	Exit Close	Toronto	K8O O8K	2
666333999	Saleh	Dice	25-Mar-1970	Male	90400	66	Straight Way	Toronto	T4E T6B	3

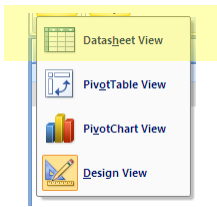


DML - Deletion

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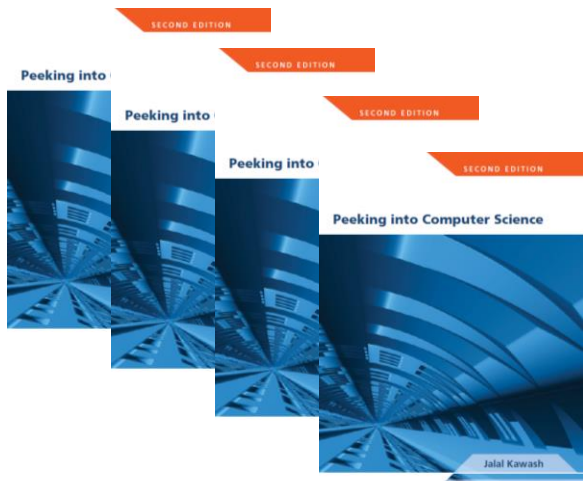
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SIN	Fname	Lname	DOB	Gender	Salary
123456789	Rajeet	Folk	30-Apr-67	Male	70000
171717171	Debra	Beacon	15-Aug-61	Female	70000
181817178	Sam	Field	17-Feb-78	Male	40000
666333999	Saleh	Dice	25-Mar-70	Male	90000
987654321	Marie	Band	12-Jan-85	Female	50000

Access Insertion and Deletion



SQL Queries

Questioning the database

By the end of this section, you will be able to:

1. Know the basic parts of speech in SQL
2. Formulate SQL queries
3. Use set operations in SQL queries
4. Use complex logic in SQL queries



Objectives

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EMPLOYEE

SIN	Fname	Lname	DOB	Gender	Salary	Number	Street	City	Pcode	Dnumber
171717171	Debra	Beacon	15-Aug-1961	Female	70000	15	Baron Hill	Calgary	T2X Y0Y	1
181817178	Sam	Field	17-Feb-1978	Male	40000	15	Kick Way	Calgary	Y2K K0K	1
123456789	Rajeet	Folk	30-Apr-1967	Male	78000	123	One Road	Toronto	H1H J9J	2
987654321	Marie	Band	12-Jan-1985	Female	53500	2828	Exit Close	Toronto	K8O O8K	2
666333999	Saleh	Dice	25-Mar-1970	Male	90400	66	Straight Way	Toronto	T4E T6B	3

DEPARTMENT

Dnumber	Dname	MGR_SIN	StartDate
1	IT	171717171	12-Feb-2008
2	Finance	123456789	1-Mar-2002
3	Marketing	666333999	1-Jan-2005

PROJ_EMP

SIN	Pnumber	Hours
171717171	1	15
171717171	2	20
171717171	4	5
181817178	1	30
181817178	2	10
123456789	3	40
666333999	4	40

PROJECT

Pnumber	Pname	Location	Dnumber
1	Web Shopping	Calgary	1
2	Network Upgrade	Calgary	1
3	New Benefits	Toronto	2
4	Product XT345	Toronto	3



Example Database

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- Ways of submitting questions to the DB:

1. Query By Example (QBE)

- JT: In Access it's graphical

2. Using SQL

- Text

Formal SQL structure

- SELECT <columns of table(s)>
- FROM <table(s) >
- WHERE <Boolean expression(s)>
- ORDER BY!

Queries



Writing SQL queries can be complex



SQL queries are powerful (i.e., unusual searches can show useful information)



SQL is commonly used (standard)

JT's Extra: My \$0.02 On Forming Queries Using SQL

Informal English description

Given some condition(s) is/are met what rows and columns of what tables will appear.

Example:

If last name is "Morris" show the employee number, first name and last name from the employees table.

JT's Extra: Basic Format Of SQL Queries



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- Specifying the query in the form of QBE (Query by example) in MS-Access

Field:	EmployeeNumber	FirstName	LastName
Table:	Employees	Employees	Employees
Sort:			
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:			*Morris*

JT's Extra: Basic Format Of SQL Queries (2)



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Formal SQL structure

- SELECT <columns of table(s)>
- FROM <table(s) >
- WHERE <Boolean expression(s)>
- ORDER BY¹

1 Optional section: used to format or rank query results

JT's Extra: Basic Format Of SQL Queries (3)



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- **SELECT**
 - Employees.EmployeeNumber,
 - Employees.FirstName,
 - Employees.LastName
- **FROM** EMPLOYEES
- **WHERE**
EMPLOYEES.LastName="Morris";

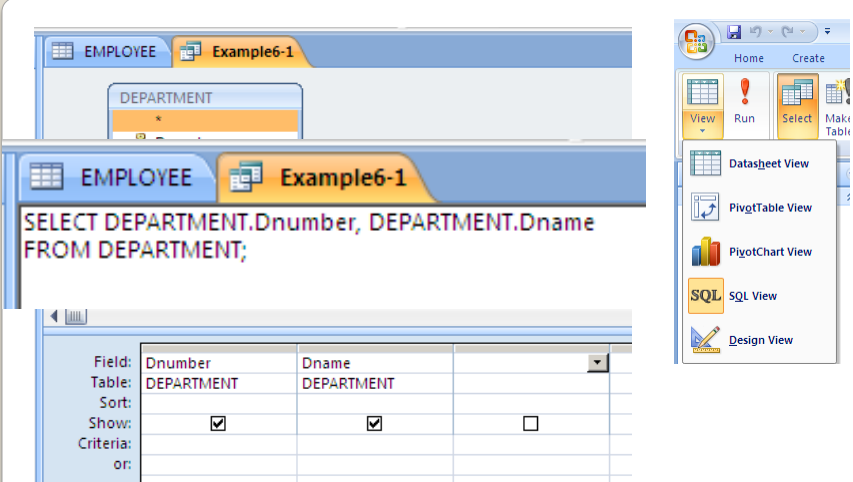


JT's Extra: Example SQL Query

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QBE – Projection

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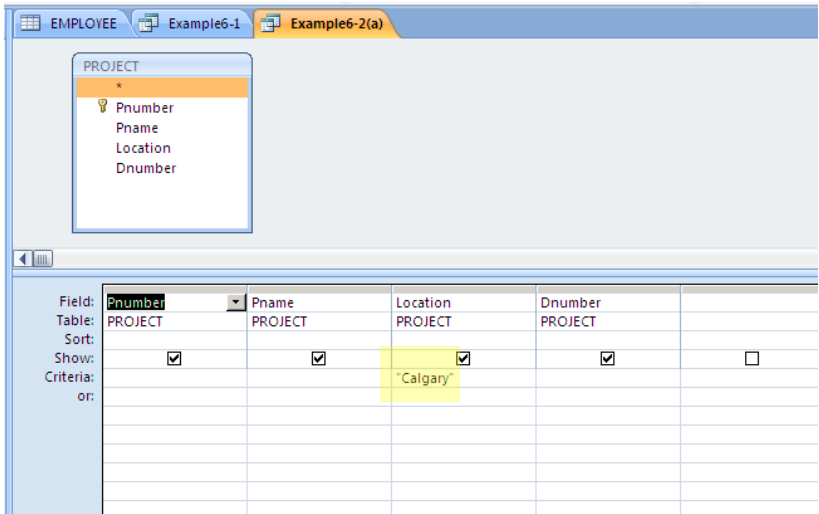
**SELECT Dnumber, Dname
FROM DEPARTMENT**

DEPARTMENT

Dnumber	Dname	MGR_SIN	StartDate
1	IT	177717771	12-Feb-2008
2	Finance	123456789	1-Mar-2002
3	Marketing	666333990	1-Jan-2005

SQL - Projection

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The screenshot shows a database query builder window with two tabs: 'Example6-1' and 'Example6-2(a)'. A 'PROJECT' table is selected, showing fields: Pnumber, Pname, Location, and Dnumber. Below, a query grid is visible with the following criteria:

Field:	Pnumber	Pname	Location	Dnumber	
Table:	PROJECT	PROJECT	PROJECT	PROJECT	
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Criteria:			"Calgary"		
or:					

QBE - Selection

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```

SELECT Pnumber, Pname, Location, Dnumber
FROM PROJECT
WHERE Location = 'Calgary'

```

PROJECT

Pnumber	Pname	Location	Dnumber
1	Web Shopping	Calgary	1
2	Network Upgrade	Calgary	1
3	New Benefits	Toronto	2
4	Product XT345	Toronto	3

SQL - Selection

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Poker is the wildcard in card game

- It can be substituted for any other card
- In the example it can take the place of: Ace, King, Queen, Jack or Ten to give you a "Royal Flush"

JT's Extra: Wildcards

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- The 'wildcard' character can stand for any number of characters in the position that it's placed:
 - Example queries that follow will be from the Employees table:

Employees : Table							
	SIN	LastName	FirstName	Address	City	Province	PostalCode
▶	123 115 323	Simcox	Cole	311 Ocean View Drive	Vancouver	British Columbia	T1N-4N9
+	123 456 789	Smith	John	123 Peanut Lane	Calgary	Alberta	T1N-3N4
+	371 988 812	Carswell	Mary	425 Remington Ave	Calgary	Alberta	T3N-7N4
+	413 754 621	Kennedy	Leon	808, 4900 Wildman Ave	Racoon City	Alberta	T2S-1M0
+	444 638 047	Redfield	Claire	653 Wildpark Place	Racoon City	Alberta	T2S-1M0
+	456 438 624	Lemoy	Leonard	55 Logic Way	Vulcan	Alberta	VS1-3N3
+	456 789 123	Cartman	Eric	456 Lynchview Road	Southpark	Alberta	S0S-9A9
+	456 789 124	Simpson	Homer	59 Evergreen Terrace	Springfield	Alberta	N1E-7X6
+	456 889 123	Flanders	Ned	60 Evergreen Terrace	Springfield	Alberta	N1E-7X6
+	620 451 097	Williams	Amanda	25 Rodeo Drive	Edmonton	Alberta	V6N-6N5
+	638 666 670	Cartland	Douglas	1109, 4944 Dalworth	Silent Hill	Alberta	S6N-9X9
+	666 666 666	Morris	Heather	7 Luckstone Dr	Silent Hill	Alberta	T3A-3H1
+	666 666 667	Mason	Harry	7 Luckstone Dr	Silent Hill	Alberta	T3A-3H1
+	666 666 668	Sunderland	James	7 Heartbroken Ave	Silent Hill	Alberta	T3A-2E6
+	666 666 669	Wolf	Claudia	66 Twisted View	Silent Hill	Alberta	T1N-3O4
+	670 380 456	Edgar	Maureen	300, Lockinvar Road	Calgary	Alberta	T4P-3N9

JT's Extra: Using The Wildcard In Queries

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- Examples:

- Which employees have a last name that begins with 'm'?

	LastName	FirstName
▶	Mason	Harry
	Morris	Heather

Field:	LastName	FirstName
Table:	Employees	Employees
Sort:		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	Like "m**"	

- Which employees have a last name ends with 's'?

	LastName	FirstName
▶	Flanders	Ned
	Morris	Heather
	Williams	Amanda

Field:	LastName	FirstName
Table:	Employees	Employees
Sort:		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	Like "**s"	

JT's Extra: Using The Wildcard In Queries (Access)

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- Which employees have the letter 'a' anywhere in their first name?

	LastName	FirstName
▶	Cartland	Douglas
	Edgar	Maureen
	Lemoy	Leonard
	Mason	Harry
	Morris	Heather
	Redfield	Claire
	Sunderland	James
	Williams	Amanda
	Wolf	Claudia
	Carswell	Mary

Field:	LastName	FirstName
Table:	Employees	Employees
Sort:		
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:		Like "**a**"
or:		

JT's Extra: Using The Wildcard In Queries (Access: 2)

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```

SELECT *
FROM PROJECT
WHERE Location = 'Calgary'

```

PROJECT

Pnumber	Pname	Location	Dnumber
1	Web Shopping	Calgary	1
2	Network Upgrade	Calgary	1
3	New Benefits	Toronto	2
4	Product XT345	Toronto	3

Wild Cards

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- JT's Extra: As mentioned each table can be viewed as a set of information.

EMPLOYEES (TABLE/SET)

- * 456 789 123, Cartman Eric, Southpark
- * 456 789 124, Simpson Homer, Springfield
- * 666 666 666, Morris Heather, Silent Hill
- * 666 666 667, Mason Harry, Silent Hill
- * 670 380 456, Edgar Maureen, Calgary

Departments (TABLE/SET)

- * 1, Human Resources
- * 2, Marketing
- * 3, Finance
- * 4, Management Information Systems

TimeBilled (TABLE/SET)

- * 8, 456 789 123, 2, 10/1/2007, 80
- * 9, 456 789 124, 2, 10/1/2007, 60
- * 14, 666 666 666, 3, 10/1/2007, 50
- * 15, 666 666 667, 3, 10/1/2007, 50
- * 18, 670 380 456, 4, 10/1/2007, 40

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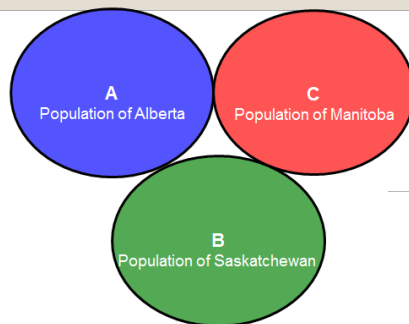
- UNION
- INTERSECT
- MINUS

JT's Extra: Set Operations On Databases

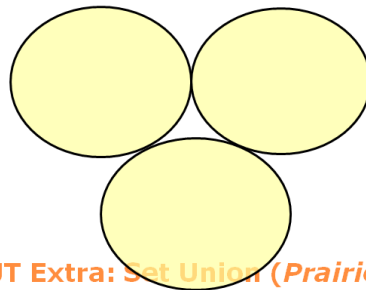


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$A \cup B \cup C = D$ (Population of the Prairie provinces)



JT Extra: Set Union (Prairies)

JT's Extra: Union (Logical "OR")



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Men Women

203 student

Men Women

203 student

Women in 203

(203 student) AND (Women)

JT's Extra: Intersection (Logical "AND")

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A = Population of the prairie provinces

B = Population of Alberta

Venn Diagram: Set Subtraction

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A - B = C

Prairies sans AB

JT's Extra: Subtraction "Minus"

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- **Format:**

<SQL Query 1>

SET OPERATION

<SQL Query 2>

JT's Extra: Forming SQL Queries Using The Set Operations



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```
SELECT *  
FROM PROJECT  
WHERE Location = 'Calgary'
```

SQL – Set Operations



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```
SELECT *  
FROM PROJECT  
WHERE Location = 'Calgary'
```

```
SELECT *  
FROM PROJECT  
WHERE Location = 'Toronto'
```

SQL – Set Operations

```
SELECT *  
FROM PROJECT  
WHERE Location = 'Calgary'
```

```
UNION
```

```
SELECT *  
FROM PROJECT  
WHERE Location = 'Toronto'
```

SQL – Set Operations

bing "wayne gretzky" or "the great one" 🔍

116,000 RESULTS Narrow by language ▾ Narrow by region ▾

[Wayne Gretzky](#) - Wikipedia, the free encyclopedia
en.wikipedia.org/wiki/Wayne_Gretzky ▾
 Early years · World Hockey Association · NHL career · International play
 Nicknamed "The Great One", he has been called "the greatest hockey player ever" by ... on guard for thee", Bryan Adams ad-libbed, "We're going to miss you, **Wayne Gretzky**".....

[The Official Website for Wayne Gretzky | Gretzky.com](#)
www.gretzky.com ▾
 The Official Website of **Wayne Gretzky** ... Mike Keenan and daughter's fight with cancer (Ocular Melanoma) Calling All Hockey Fans

[Wayne Gretzky - The Great One](#)
sarsenau.tripod.com/gretzky ▾
Wayne Gretzky 99 - The Great One, a site dedicated to the best hockey player of all time Wayne Gretzky

JT's Extra: Union Is Similar To Logical "OR" For Web Searches

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```

SELECT Fname, Lname
FROM EMPLOYEE
WHERE Salary > 80000
UNION
SELECT Fname, Lname
FROM EMPLOYEE
WHERE Department = 1;
    
```

Saleh Dice

```

SELECT Fname, Lname
FROM EMPLOYEE
WHERE Salary > 80000
        
```

**Sam Field
Debra Beacon**

```

SELECT Fname, Lname
FROM EMPLOYEE
WHERE Department = 1
        
```

JT: Both show results up (Dept. 1 employees with income over \$80k)

JT's Extra (From Textbook): Union

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- Cannot be done in design view, only in SQL view

Example6-5(a) Example6-5(b)

```

SELECT * FROM PROJECT
WHERE Location = "Calgary"
UNION SELECT * FROM PROJECT
WHERE Location = "Toronto";

```

Union in Access



JT: show query results that meets both criteria (Female employees that live in Calgary)

JT's Extra (From Textbook): Intersect

Websites containing 'James'

[the official JAMES website](#)
www.wearjames.com *
Latest JAMES news, tour dates, and reports from the road

[Images of James](#)
bing.com/images



[James \(band\) - Wikipedia, the free encyclopedia](#)
en.wikipedia.org/wiki/James_(band) *
James is a British rock band from Manchester, England. They formed in 1982 and were active throughout the 1980s, but most successful during the 1990s. Their hit ...

Websites containing 'Tam'

[TAM Airlines](#)
www.tam.com *
Mt. Tam Systems is a web technology and media engineering company.

[TAM Airlines - Wikipedia, the free encyclopedia](#)
en.wikipedia.org/wiki/TAM_Airlines *
History Destinations Fleet Airline affinity program
TAM Airlines (Portuguese: TAM Linhas Aéreas is the Brazilian brand of LATAM Airlines Group . The merger of TAM with LAN Airlines was completed on June 22, 2012. The ...

[TAM - Wikipedia, the free encyclopedia](#)
en.wikipedia.org/wiki/TAM *
Finance Military People Science Technology Transport
TAM may refer to: **Total addressable market**, a financial term used to reference the revenue opportunity available for a product or service Military Tbilisi Aircraft ...

↓ ↓

Websites containing 'James' AND 'Tam'

↓ ↓

[Images of James tam](#)
bing.com/images



[Faculty Home page: James Tam, University of Calgary](#)
pages.oups.calgary.ca/~tamj *
Home Teaching Research About me The faculty home page of James Tam
Contact information Office: ICT 737 Email: tamj@oups.calgary.ca

[Teaching for James Tam - Home | University of Calgary](#)
pages.oups.calgary.ca/~tamj/teaching.html *
Future teaching (tentative teaching assignments for fall 2013 and winter 2014)

FYI: Search engine input: james tam (defaults to 'AND')

JT's Extra: Intersection Is Similar To Logical "AND" For Web Searches

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SELECT

FROM

WHERE

INTERSECT

SELECT

FROM

SIN

EMPLOYEE

Gender = 'Female'

MGR_SIN

DEPARTMENT

SQL – Set Operations

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```

SELECT SIN
FROM EMPLOYEE
WHERE Gender = 'Male'
MINUS
SELECT MGR_SIN
FROM DEPARTMENT;
    
```

S1 = SIN of all male employees

MINUS

S2 = SIN of all employees that are managers

JT's Extra (From Textbook): Minus

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Websites containing 'James' AND 'Tam'

Subtract all pages that contain 'ucalgary'

FYI: Search engine input:
james tam -ucalgary

JT's Extra: Minus Is Similar To 'Subtract' In Web Searches

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```
SELECT SIN
FROM EMPLOYEE
WHERE Gender = 'Male'
MINUS
SELECT MGR_SIN
FROM DEPARTMENT
```

SQL – Set Operations

- No direct support
- Can use IN for intersect
- Can use NOT IN for Minus

INTERSECT and MINUS in Access

Example 6-4(b)

```
SELECT SIN
FROM employee
WHERE Gender = 'Female'
AND SIN IN
(SELECT MGR_SIN
FROM DEPARTMENT);
```

INTERSECT in Access

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```
SELECT SIN
FROM employee
WHERE Gender = 'Female'
AND SIN IN
(SELECT MGR_SIN
FROM DEPARTMENT);
```

Result
171717171

MGR_SIN
171717171
123456789
666333999

EMPLOYEE

SIN	Fname	Lname	DOB	Gender	S
171717171	Debra	Beacon	15-Aug-1961	Female	7
151817178	Sam	Piero	17-Feb-1978	Male	4
123430789	Rajeev	Folk	30-Apr-1967	Male	7
987654321	Marie	Band	12-Jan-1985	Female	5
666333999	Saten	Dice	23-Mar-1970	Male	9

How IN Works

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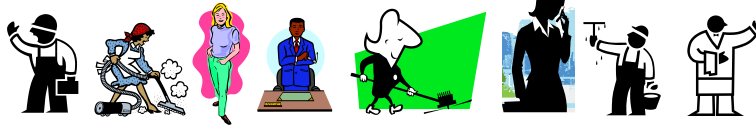
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Example6-4(c)

```
SELECT EMPLOYEE.Sin
FROM EMPLOYEE
WHERE (((EMPLOYEE.Sin) Not In
(SELECT DEPARTMENT.MGR_SIN FROM DEPARTMENT)));
```

JT: Effect of query



MINUS in Access

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- Equals =
- Not equal !=
- Greater >
- Greater or equal >=
- Less than <
- Less than or equal <=

Comparison Operators

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- AND
- OR
- NOT



Boolean Operators

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```
SELECT  Lname, DOB
FROM    EMPLOYEE
WHERE   Gender = 'Female'
        AND Salary > 40000
```



SQL – Example Query

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Example6-5(a)

EMPLOYEE

- SIN
- Fname
- Lname
- DOB
- Gender
- Salary
- Number
- Street
- City
- Pcode
- Dnumber

Field:	Lname	DOB	Gender	Salary
Table:	EMPLOYEE	EMPLOYEE	EMPLOYEE	EMPLOYEE
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:			"Female"	>40000
or:				

QBE – Example Query

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Example6-5(a)

EMPLOYEE

- SIN
- Fname
- Lname
- DOB
- Gender
- Salary
- Number
- Street
- City
- Pcode
- Dnumber

Field:	Lname	DOB	Gender	Salary
Table:	EMPLOYEE	EMPLOYEE	EMPLOYEE	EMPLOYEE
Sort:				
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:			"Female"	>40000
or:				

JT: cross column = "AND"

QBE – Example Query

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```
SELECT SIN, Lname, Fname
FROM EMPLOYEE
WHERE Salary >= 30000
AND Salary <= 50000
```

SQL – Example Query

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```
SELECT SIN, Lname, Fname
FROM EMPLOYEE
WHERE ( Gender = 'Male' AND Salary > 30000 )
OR ( Gender = 'Female' AND Salary > 40000 )
```

SQL – Example Query

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EMPLOYEE

- SIN
- Fname
- Lname
- DOB
- Gender
- Salary
- Number
- Street
- City
- Pcode
- Dnumber

Field:	SIN	Lname	Fname	[Gender]	[Salary]
Table:	EMPLOYEE	EMPLOYEE	EMPLOYEE	EMPLOYEE	EMPLOYEE
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				'Male'	>3000
or:				'Female'	>40000

QBE – Example Query

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EMPLOYEE

- SIN
- Fname
- Lname
- DOB
- Gender
- Salary
- Number
- Street
- City
- Pcode
- Dnumber

Field:	SIN	Lname	Fname	[Gender]	[Salary]
Table:	EMPLOYEE	EMPLOYEE	EMPLOYEE	EMPLOYEE	EMPLOYEE
Sort:					
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Criteria:				'Male'	>3000
or:				'Female'	>40000

QBE – Example Query

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- Take care not to specify queries that can never be true! (Logic: contradiction)
- This will result in an “Empty Query”, a query that yields no results.
 - Example: Which employees have a gross pay lower than \$1,000 AND higher than \$2,000 (inclusive for both) on one of their time cards?

Query

StartPayPeriod	PayRate	HoursWorked	GrossPay: [PayRat
TimeBilled	Employees	TimeBilled	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
k=1000 And >=2000			

Result of the (empty) query

Employees with pay les than \$1K AND greater than \$2K : Select Query						
SIN	LastName	FirstName	StartPayPeriod	PayRate	HoursWorked	GrossPay

JT's Extra: Empty Queries (Contradiction)

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Wav file from “The Simpson” © Fox

- In a similar fashion take care not to specify queries that are always true. (Tautology)

Query

Field:	YearsOfService	LastName	FirstName
Table:	Employees	Employees	Employees
Sort:			
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:	>=10		
or:	k<=20		

SQL

```
SELECT Employees.YearsOfService,
Employees.LastName, Employees.FirstName
FROM Employees
WHERE (((Employees.YearsOfService)>=10))
OR (((Employees.YearsOfService)<=20));
```

Query result

YearsOfServ	LastName	FirstName
8	Tam	James
2	Morris	Heather
10	Mason	Harry
2	Cartman	Eric
1	Griffin	Stewie
15	Pike	Christopher
25	Lee	Bruce
12	Long	Fei
7	Akash	Akabar
20	Linnear	Nicolas

JT's Extra: Queries Resulting From A Tautology

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