

Plan...

- Class preparation... 2/7 questions
- Group work (7 groups, 5-10 minutes)
 - Each groups reviews responses to one question
 - Determines “best” response to share with class
 - Identifies observations about diff solutions
- Presentations (~30 minutes)
 - 3-5 minute presentation
 - Present solution / observations
- Mini-Lecture (~10 minutes)
 - Queries with multiple tables...

Single Table Queries...

Set 1: Using technical language..

- *1A. What unique IP addresses visited from Germany?*
- *1B. How many hits did each unique IP address have?*
- *1C. What are the IP addresses and number of hits for IP addresses that visited the Arthritis Source between 2:00 AM and 3:00 AM?*
- *1D. What did the following IP addresses do when they accessed the site: (1) cust9.max12.washington.dc.ms.uu.net, (2) festpc02.ib.be, (3) gatekeeper.volvo.se, (4) goldentrout.execpc.com*

Set 2: Requiring more inference...

- *2A. Who accessed the Arthritis Source from European Countries?*
- *2B. Which movies have been accessed the most?*
- *2C. Have users been visiting the Arthritis Source in the early morning hours? If so, who and how much?*

Queries with Multiple Tables

- Until now, we have focused on queries with single tables
- What if question requires attributes from multiple tables
 - INNER JOIN
 - LEFT JOIN
 - RIGHT JOIN

JOIN TYPES

- Syntax

```
SELECT field1, field2, ...  
FROM TABLE1, TABLE2  
      TABLE1 _____ JOIN TABLE2  
      ON [TABLE1].field = [TABLE2].field
```

- Join Types

- INNER:

- Includes only rows where the joined fields from both tables are equal.

- LEFT:

- TABLE1 **drives** the query results
- Includes all records from TABLE1 and only records from TABLE2 when the joined fields are equal.

- RIGHT:

- TABLE2 **drives** the query results
- Includes all records from TABLE2 and only records from TABLE1 when the joined fields are equal.

Example

- Imagine a new table – regUsers
 - Design
 - regUserIP
 - regUserName
 - ...
 - Explanation
 - Customers do **not** need to be registered to use
 - hitData will contain IP addresses **not** on regUser
 - Registered customers **do not** need to use
 - regUser may have IPs which have no hits in hitData

Question: What resources did each registered user access?

- “Where clause” approach
- JOIN approach

Question: What resources did each registered user access?

- “Where clause” approach

```
SELECT [CUSTOMER].customerName, [HITDATA].resourceName  
FROM CUSTOMER, HITDATA  
WHERE [CUSTOMER].customerIP = [HITDATA].ip
```

- JOIN approach

```
SELECT [CUSTOMER].customerName, [HITDATA].resourceName  
FROM CUSTOMER, HITDATA  
CUSTOMER INNER JOIN HITDATA  
ON [CUSTOMER].customerIP = [HITDATA].ip
```

Question: What resources did each customer access?

Variations

- Previous:

```
SELECT [CUSTOMER].customerName, [HITDATA].resourceName  
FROM CUSTOMER, HITDATA  
      CUSTOMER INNER JOIN HITDATA  
      ON [CUSTOMER].customerIP = [HITDATA].ip
```

- Create a list of resources accessed by EACH and EVERY customer – if customers accessed no resources, include that on the list.

```
SELECT [CUSTOMER].customerName, [HITDATA].resourceName  
FROM CUSTOMER, HITDATA  
      CUSTOMER _____ JOIN HITDATA  
      ON [CUSTOMER].customerIP = [HITDATA].ip
```

Question: What resources did each customer access?

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- Previous:

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SELECT [CUSTOMER].customerName, [HITDATA].resourceName  
FROM CUSTOMER, HITDATA  
      CUSTOMER INNER JOIN HITDATA  
      ON [CUSTOMER].customerIP = [HITDATA].ip
```

- Create a list of all resources accessed, and customer Name if it is known.

```
SELECT [CUSTOMER].customerName, [HITDATA].resourceName  
FROM CUSTOMER, HITDATA  
      CUSTOMER _____ JOIN HITDATA  
      ON [CUSTOMER].customerIP = [HITDATA].ip
```

Question: What resources did each customer access?

Variations

- Create a list of resources accessed by EACH and EVERY customer – if customers accessed no resources, include that on the list.

- Create a list of all resources accessed, and customer Name if it is known.