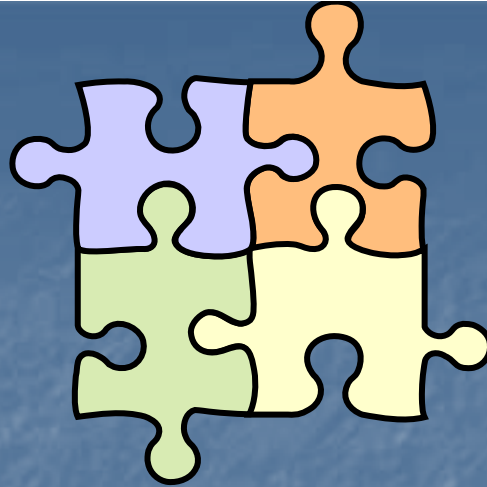




Tables In AQS

Making the Pieces Fit

Site / Monitor Tables

- Sites – WHERE is the data?
 - State + County + Site ID
- Monitors – WHAT is monitored
 - AQS Site ID + Parameter + POC
- Monitor Children (Monitor Types / Agencies / etc)
 - AQS Monitor ID + Date Range

Data Tables

- Raw Data
 - Monitor ID + Date + Time of Day
- Summary Data (Daily / Quarterly / Annual)
 - Monitor ID + Time Period + Duration + Exceptional Event Type
 - Types of Time Periods
 - Year (Annual)
 - Year + Quarter (Quarterly)
 - Year + Month + Day (Daily)

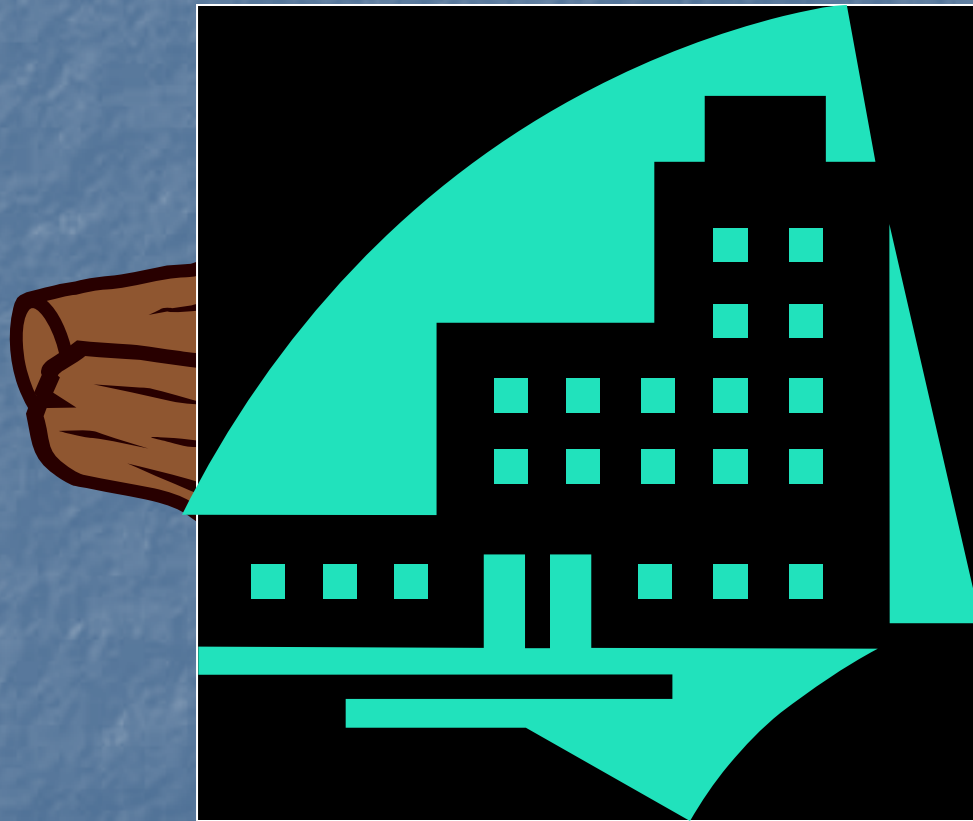
Discoverer Limitations

- By Default, You Cannot Select From Multiple Child Tables
- Can be Overridden
 - Tools → Options → Advanced → Click on “Disable fan trap detection”

Functions



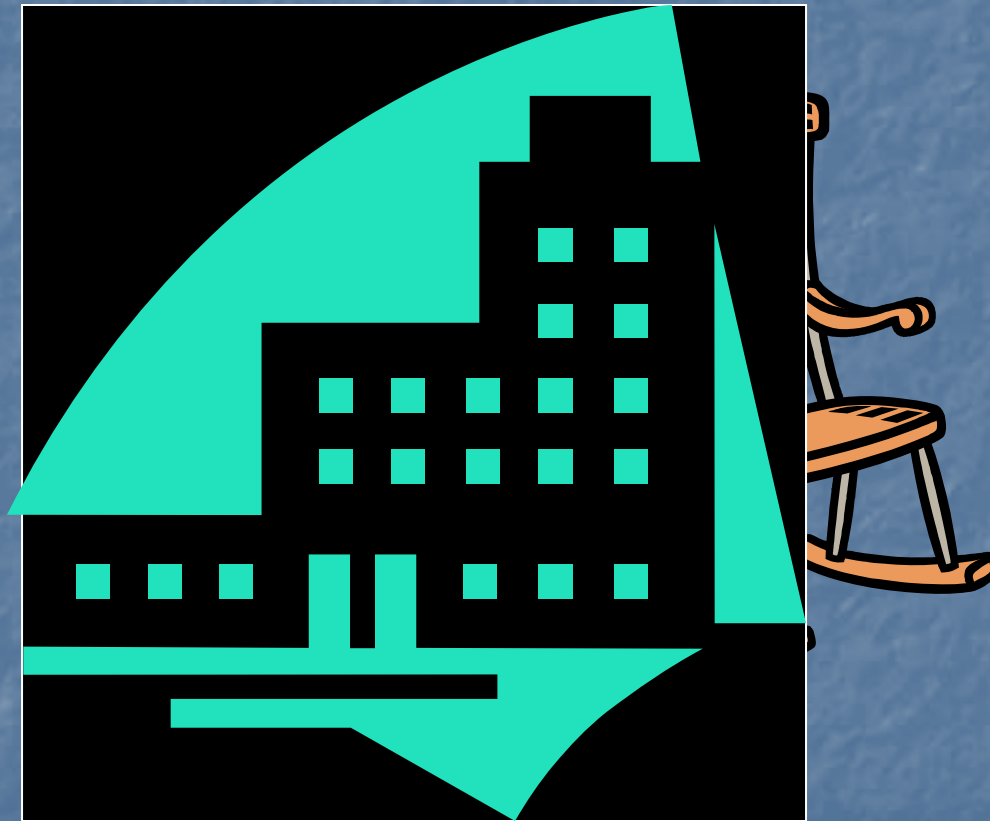
Functions



Functions



Functions



Functions



What is a Function?

- Stored Software that Manipulates Submitted Elements and Returns Some Value
 - May be a SQL Standard Function (SUBSTR)
 - Could be Application Specific (GET_METHOD)
- Generally Two Categories
 - Creation of New Objects From Old Ones
 - Descriptions of Objects

Function Notation

- FUNCTION(parameter {datatype}, [optional parameters])
- Datatypes
 - VARCHAR2 ('Apple', 'Sample Text *', '1234')
 - NUMBER (1, 1.03, -15)
 - DATE – We'll talk about this one later...

Types of Functions

- String Functions
- Mathematical Functions
 - Single-Value Functions
 - Group-Value Functions
 - List Functions
- Conversion / Transformation Functions
- Date Functions

Common String Functions

- ||
- INITCAP(String)
- INSTR(String, set [, start [, occurrence]])
- LENGTH(String)
- LOWER(String) / UPPER(String)
- LPAD(String, Length [, 'set']) / RPAD(String, Length [, 'set'])
- LTRIM(String [, 'set']) / RTRIM(String [, 'set'])
- SUBSTR(String, Start [,count])

Concatenate (||)

- Glues two Strings Together

'Go' || ' WOLFPACK' → Results: "Go WOLFPACK"

INITCAP, UPPER, LOWER

- Deals with the Capitalization of Strings
 - INITCAP – Capitalizes first letter of a string as well as after spaces, periods. Lower case for all other letters
 - UPPER – All Upper Case
 - LOWER – All Lower Case

INITCAP('gO woLFpack') → "Go Wolfpack"

UPPER ('gO woLFpack') → "GO WOLFPACK"

LOWER('gO woLFpack') → "go wolfpack"

“In String” - INSTR

- Finds the Position of a String Within a String

INSTR('Go Wolfpack', 'ac') → Results: 9

- Optionally can tell it Where to Start and What Occurrence to Find

INSTR('Go Wolfpack', 'o', 1, 2) → Results: 5

LENGTH

- Tells you How Long a String Is (Spaces Count)

LENGTH('Go Wolfpack') → Result: 11

LPAD / RPAD

- “Pads” Out a String To a Given Length
 - Defaults to Pad with a Space
 - You May Optionally Specify What Character to Use

LPAD('Carrot',10) → Result: “**Carrot**”

RPAD('Carrot',10, 'x') → Result: “**Carrotxxxx**”

LTRIM / RTRIM

- Trims off a Set of Characters from Either the Left (LTRIM) or Right (RTRIM) of a String
 - Keeps Trimming Until No More of the SET of Characters are Found

RTRIM('Go Wolfpack', 'k') → Results: "Go Wolfpac"

LTRIM('Go Wolfpack', 'oGfW') → Results: "lfpack"

Substring - SUBSTR

- Clips out a Portion of a String
 - May Tell it How Many Characters to Clip (Default is to clip to end of the string)

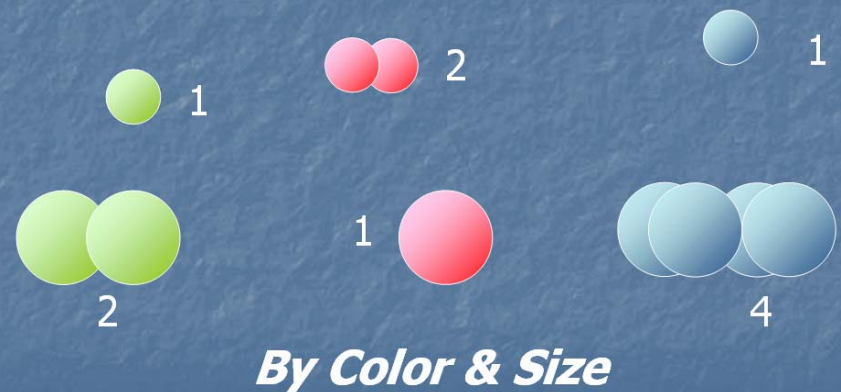
SUBSTR('Go Wolfpack', 8) → Results: "pack"

SUBSTR('Go Wolfpack', 8,3) → Results: "pac"

Mathematic Functions

- ABS – Absolute Value
- CEIL / FLOOR – Smallest Integer Above / Below Value
- MOD – Modulus
- POWER
- ROUND
- SQRT – Square Root
- TRUNC – Truncate
- List Functions
 - GREATEST (List)
 - LEAST (List)

Group Functions



Group Functions Example

- When you use the GROUP functions, you must specify the breaking elements in a GROUP BY clause
 - These must include all non-group function items in your SELECT statement
 - Only works for NUMERIC Columns in Discoverer
 - In Discoverer, you must pick the Group Type from the “Select Items” tab

Transformation Functions

- NVL – Null Value Function
 - Default value to return if the column value is NULL
- DECODE – SQL version of an “IF” Statement
- Type Conversions
 - TO_DATE – Convert a String to a Date
 - TO_NUMBER – Convert a String to a Number
 - TO_CHAR – Convert a Date or Number to a String

NVL & DECODE Example

- How do you select a Tribal Site ID?
- IF a Tribal Code exists for a site, Use “TT” for the state code, the Tribal Code for the county and the site id. Otherwise use the State Code, County Code and Site ID

```
DECODE(tribal_code, NULL, cn_stt_state_code, 'TT')  
  || '-' || NVL(ta_tribal_code, cc_cn_county_code)  
  || '-' || site_id
```

Oracle Dates

- Dates stored in Oracle as a number
 - January 1, 4712 BC – December 31, 4712 AD
 - Use the TO_CHAR function to display the way you want it
 - System default is usually DD-MON-YY Format
 - Dates are stored down to the second
- “SYSDATE” = Right now (down to the second)

Date Comparisons

- If you compare two date values, the values must match down to the second
 - `TO_DATE('20060605', 'YYYYMMDD') = sysdate` is not a true statement.
- You can perform any arithmetic comparison between 2 dates
 - `>` , `<` , `=` , `!=` , `BETWEEN`

Date Functions

- You can convert a string to a date (TO_DATE) and a date to a string (TO_CHAR)
 - TO_DATE('2004-NOV-02', 'YYYY-MON-DD')
 - TO_CHAR(sysdate, 'YYYYMMDD')
- You can truncate a date (TRUNC) to make comparisons easier
 - TRUNC(SYSDATE) = Midnight of today's date
 - TRUNC(SYSDATE, 'YYYY') = January 1 of the current year
 - TRUNC(SYDATE, 'MM') = Day 1 of the current month

Date Comparison Example

- Select Monitor ID, Year, Monitor Type for Texas Ozone SLAMS monitors between 2000 and 2003

Date Arithmetic

- If you subtract one date from another you get the number of days between the two dates
- If you add or subtract a number to a date you get a date that many days in the future (+) or past (-)

More Date Functions

- `ADD_MONTHS` – Move a date x months into the future
- `LAST_DAY` – Returns the date that is the last day of the month for the supplied month
- `MONTHS_BETWEEN` – Number of months between 2 dates
- `ROUND` – Like `TRUNC`, but will give you the higher formatted value if more than $\frac{1}{2}$ of the period has expired

Date Arithmetic & Function Example

- Select the time right now (Hour, minute, second), the number of days since the first of the year, the number of days until the end of the year, the number of days until the end of the month, number of hours left in the day

TO_CHAR(sysdate, 'HH24:MI:SS') → right now,
TRUNC(sysdate) – TRUNC(sysdate, 'YYYY') → first of year,
TRUNC(ADD_MONTHS(sysdate,12), 'YYYY') – TRUNC(sysdate) → end of year,
TRUNC(ADD_MONTHS(sysdate,1), 'MON') – TRUNC(sysdate) → end of month,
ROUND((TRUNC(sysdate+1) – sysdate) * 24) → Number of Hours left in the day

Summary

- Functions are pre-written programs that may take variables and returns a value
- Oracle has several built-in functions
 - String
 - Math
 - Date
 - Translation
- Functions can be used in combination

Summary (Continued)

- A function may have multiple meanings based on the type of information provided (TRUNC for example)
- Oracle Dates
 - Be careful you know what time you have
 - Date arithmetic
 - Date functions

Any Questions?