- Marie Coleman - 04:31 PM
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SCHRUG Alliance 2016

Session Title:	PS Advanced Query Writing
Session Number:	5144
Track:	General Interest Track
Session Type:	Pre Conference Workshop
Room Assignment:	Space City - Rm 214 => Thu, Jul 28, 2016 (03:00 PM - 04:30 PM)
Initial Submission:	May 06, 2016 06:20 AM America/Central
Status:	Approved and Accepted
Session Submitter:	Marie Coleman
Primary Presenter:	Marie Coleman University of Houston System Application Lead You are currently missing the following information from your user profile: **Profile Picture**. Please click here to update your profile information.
Co-Presenter:	[Unassigned]
Co-Presenter 2:	[Unassigned]

Vendors not allowed to download files?:	No
Last Update:	May 23, 2016 10:05 AM America/Central
Short Details:	Attendees will be exposed to the concepts of query writing and the functionality offered by the PeopleSoft Query toolset in developing advanced queries. The PS Query toolset provides the easiest mechanism to create and generate simple reports in PeopleSoft
Details:	This workshop guides users in learning the concepts and procedures related to the PeopleSoft Query toolset. The PS Query toolset provides the easiest mechanism to create and generate simple reports from PeopleSoft. While PS Queries cannot be used to produce highly formatted and graphical reports, it is very effective in extracting day-to-day inquiry queries that are of interest to employees, managers and administrators. Data extracted through the PS Query tool is also frequently used as the data source in other processes such as Pop-Select. Building on concepts presented from Basic Query Writing, topics covered in this workshop include: - Understand how to incorporate advanced query features - Creating queries with Aggregate Functions - Creating queries with Having Criteria - Creating queries with Grouped Criteria ("AND" vs "OR") - Creating queries with Prompts, Prompt Defaults, and Optional Prompts - Creating queries with Expressions, Drilling URLs, using SQL Functions, Regular Expressions, and Partitioning - Joining Multiple Tables, working with Effective Date outer joins - Creating queries that use Subqueries - Creating queries with Unions - Query Administration - Query Metadata tables (PSQRY)
Additional Notes:	
Session Length:	Workshop (90-120 minutes)
Learning Objectives:	* Learn advanced query writing methodology. * Understand the advanced query writing functionality offered by the PS Query tool and know how to apply the mechanics of writing an advanced query in PS for complex data extraction needs. * Become familiar with broader PS Query writing concepts related to using SQL functions

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PEOPLESOFT ADVANCED QUERY WRITING

Session 5144

July 28, 2016

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PS Basic Query Writing

- Advanced query functionality for complex data extractions in PeopleSoft Query Manager.

Your Presenter:

- Marie Coleman

  Application Lead, University of Houston System

  8 years PeopleSoft experience in Higher Education

Overview

- Attendees will be exposed to advanced concepts of query writing and the functionality offered by the PeopleSoft Query toolset in developing complex queries. The PS Query toolset provides non-technical/functional users the easiest mechanism to create and generate simple data reports from PeopleSoft.

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Agenda/Contents

- Creating queries with Aggregate Functions and using Having Criteria
- Creating queries with Prompts, Prompt Defaults, and Optional Prompts
- Creating queries with Expressions, using SQL Functions, and Partitioning
- Joining Multiple Tables, working with Effective Date outer joins

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Agenda/Contents

- Creating queries that use Subqueries
- Creating queries with Unions
- Query Administration

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University of Houston System

- Established in 1927
- Serving 66,000~ students
- Staffed by 7,000~ employees
- UH System institutions:
  - UH Central
  - UH Clear Lake
  - UH Victoria
  - UH Downtown (conversion from Banner to PeopleSoft targeted for Fall 2018)

UH System & Oracle

Campus Solutions

- Application v. 9.0; Bundle 41
- PeopleTools v. 8.54

HRMS

- Application v. 9.2
- PeopleTools v. 8.54

Finance

- Application v. 9.1
- PeopleTools v. 8.54

Oracle Database 11g

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Learning Objectives

- Learn advanced PS Query concepts
- Understand the advanced functionality offered by the PS Query tool and know how to successfully apply the mechanics of writing an advanced query in PS for complex data extraction need
- Become familiar with broader PS Query writing concepts related to using SQL functions in developing queries, and using Query Administration on the administrative back end

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PeopleSoft Query Writing: Advanced

Aggregate Functions and Having Criteria

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Aggregate Functions

- In a standard query, each row in the result set corresponds to an individual row in the table that you are querying. Sometimes, however, you instead want a summary of the information in multiple rows. For example, you might want to know how many students are currently associated to the programs.
- You can query for this kind of summary information using Aggregate Functions.

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Aggregate Functions

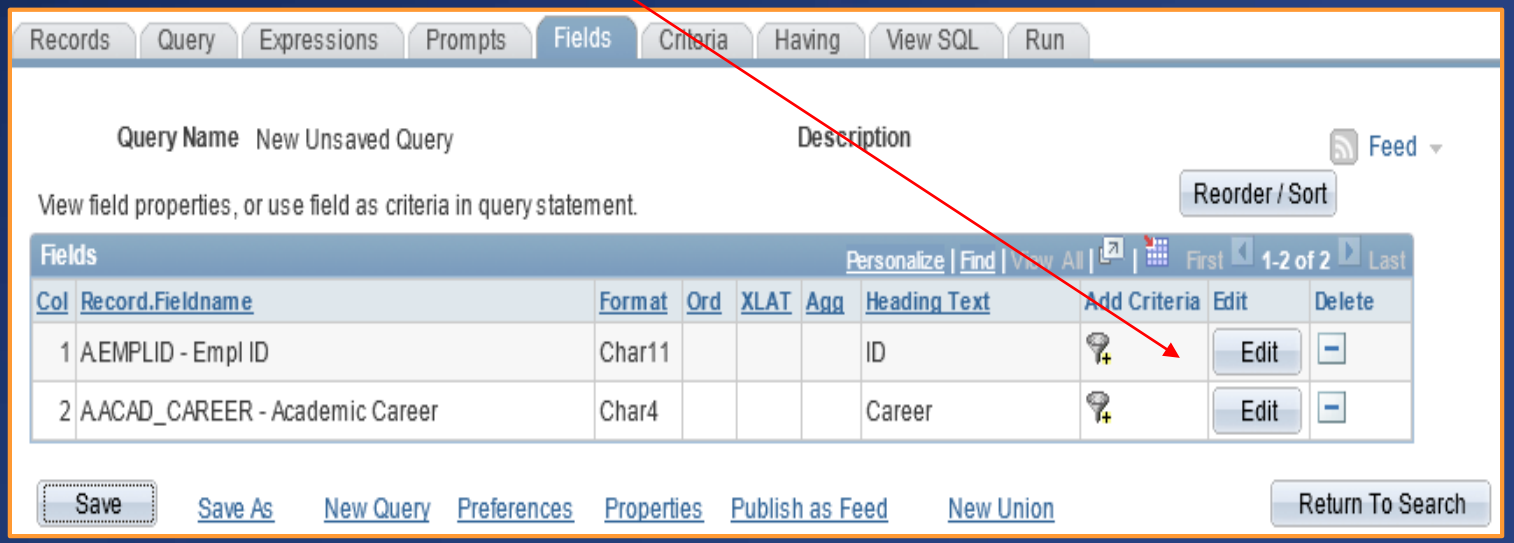
- An aggregate function is a special type of operator that returns a single value based on multiple rows of data. When your query includes one or more aggregate functions, PeopleSoft Query collects related rows and displays a single row that summarizes their contents.

Aggregate Functions

- Options for aggregating fields include:
  - None: Will not use aggregate functions.
  - Sum: Adds the values from each row and displays the total
  - Count: Counts the number of rows
  - Min (minimum): Checks the value from each row and returns the lowest one
  - Max (maximum): Checks the value from each row and returns the highest one
  - Average: Adds the values from each row and divides the result by the number of rows.

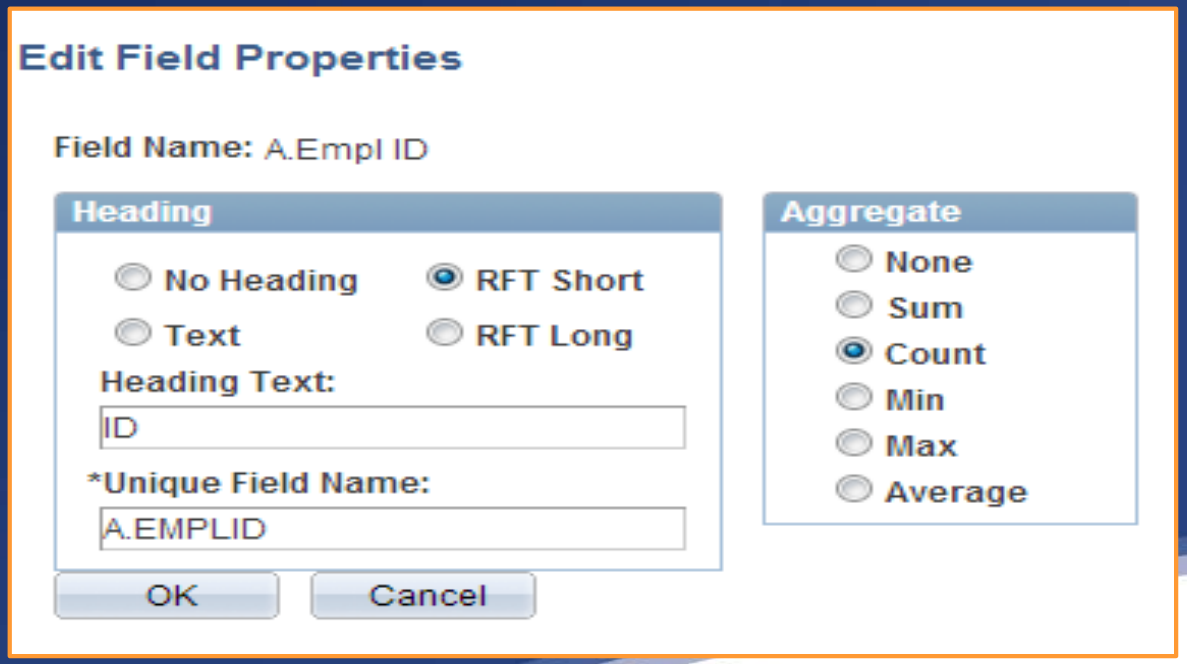
Aggregate Functions

- To add an aggregate:
  - Click on the Edit button for the field's properties in the Fields tab.



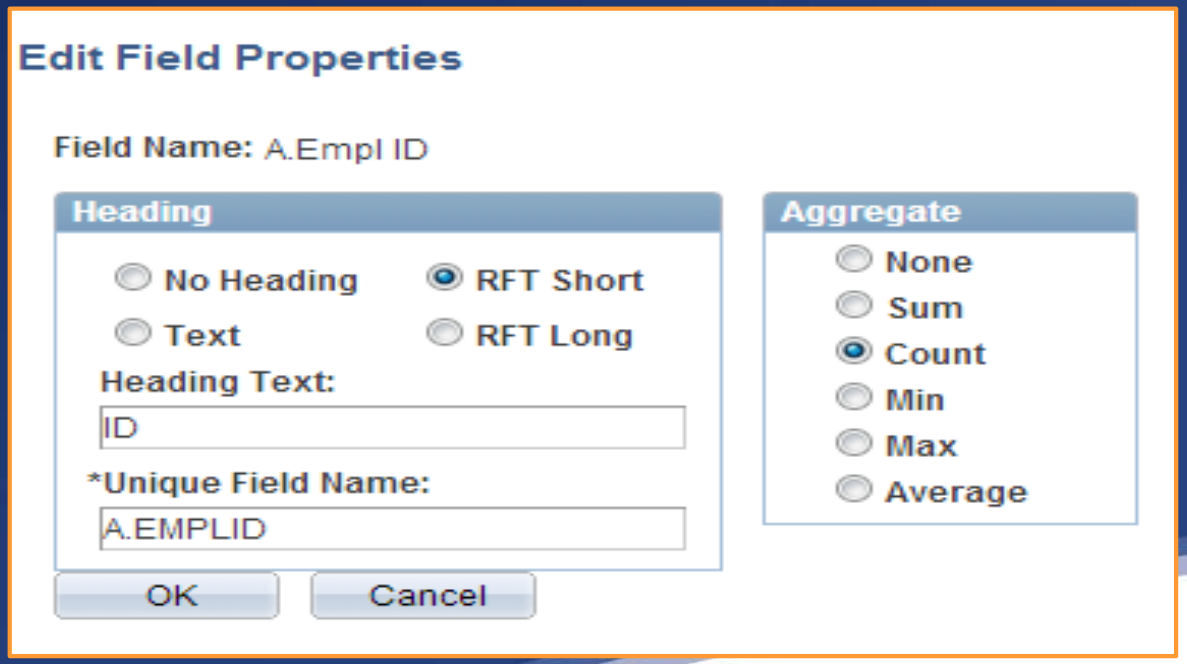
Aggregate Functions

- To add an aggregate…
  - Under the Aggregate group box on the right hand side of the page, click on the desired aggregate Radio Button and Click OK .



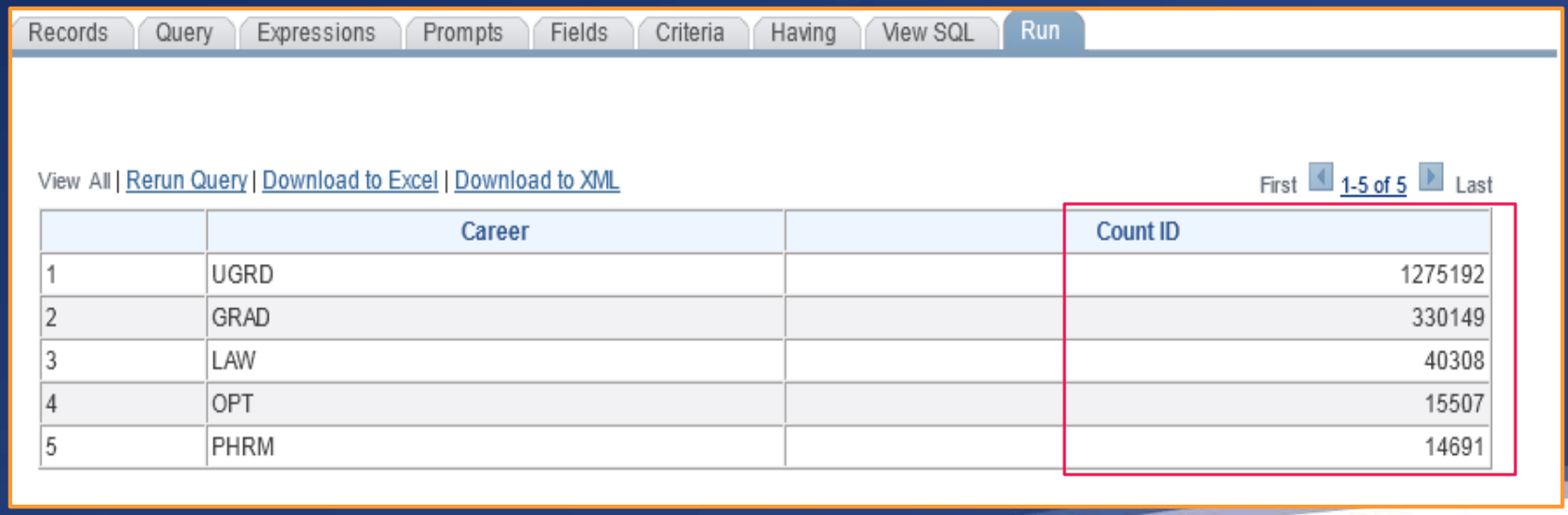
Aggregate Functions

- To add an aggregate…
  - Under the Aggregate group box on the right hand side of the page, click on the desired aggregate Radio Button and Click OK .



Aggregate Functions

- To add an aggregate…
  - Running the query, you will see summarized values for the aggregated field that are grouped by the non-aggregated fields.



	Career		Count ID
1	UGRD		1275192
2	GRAD		330149
3	LAW		40308
4	OPT		15507
5	PHRM		14691

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Having Criteria

- The “Having” page allows the user to create and edit criteria for fields that have aggregate functions associated with them.
- You cannot use fields that are being aggregated as regular criteria.
  - SQL does not support the use of aggregate functions in WHERE clauses.
  - Therefore, after you have applied an aggregate function to a field, you cannot use that field in your selection criteria, which corresponds to a SQL WHERE clause.

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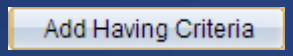
Having Criteria

- When you want to filter rows based on the results of an aggregate function, Query Manager enables you to create HAVING criteria.
  - You might use such criteria, for example, when you want a list of the students having two or more degrees.
  - In SQL, a HAVING clause is similar to a WHERE clause for rows of data that have been aggregated into a single row of output. The system evaluates WHERE clauses by looking at the individual table rows before they are grouped by the aggregate function, and then it evaluates HAVING clauses after applying the function.

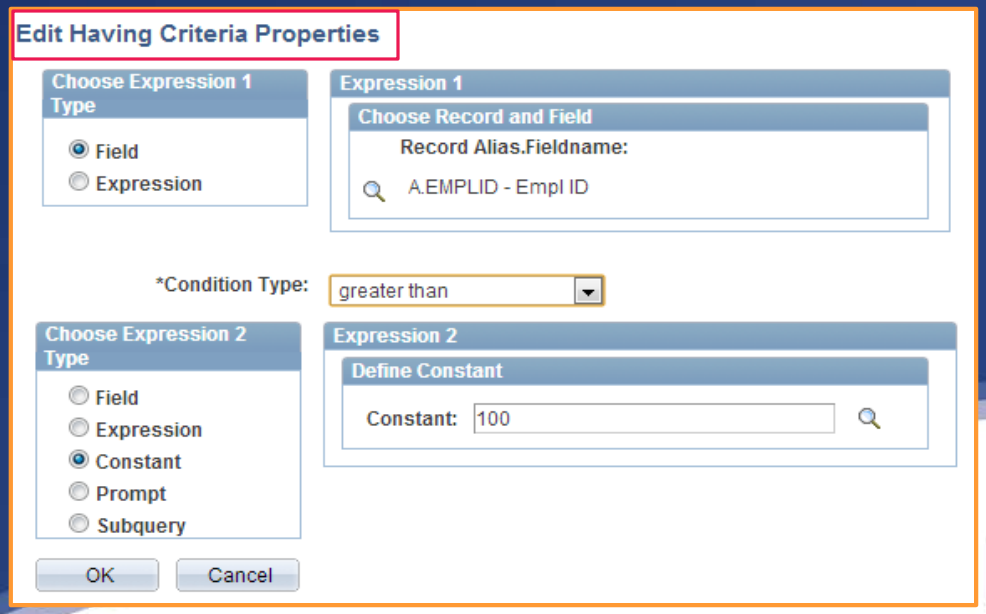
Having Criteria

- When you click the Add Criteria icon from the Fields or Query pages for an aggregate field, new criteria is added to the Having page instead of the Criteria page.
- Add selection criteria using the Having page in the same way that you add selection criteria using the Criteria page. Keep in mind that PeopleSoft Query compares the result of applying the aggregate function to the comparison value

Having Criteria

- To add having criteria:
  - Having criteria can be initiated either from the Having tab and clicking on the Add Having Criteria 

button, or can be initiated by clicking on the Criteria funnel icon from the Query and Fields tabs.
  - Set the appropriate criteria condition type for the aggregated field and appropriate Expression 2 parameters.



Seeing it in Action...

Aggregate Functions and Having Criteria

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PeopleSoft Query Writing: Advanced

Creating queries with Prompts, Prompt Defaults, and Optional Prompts

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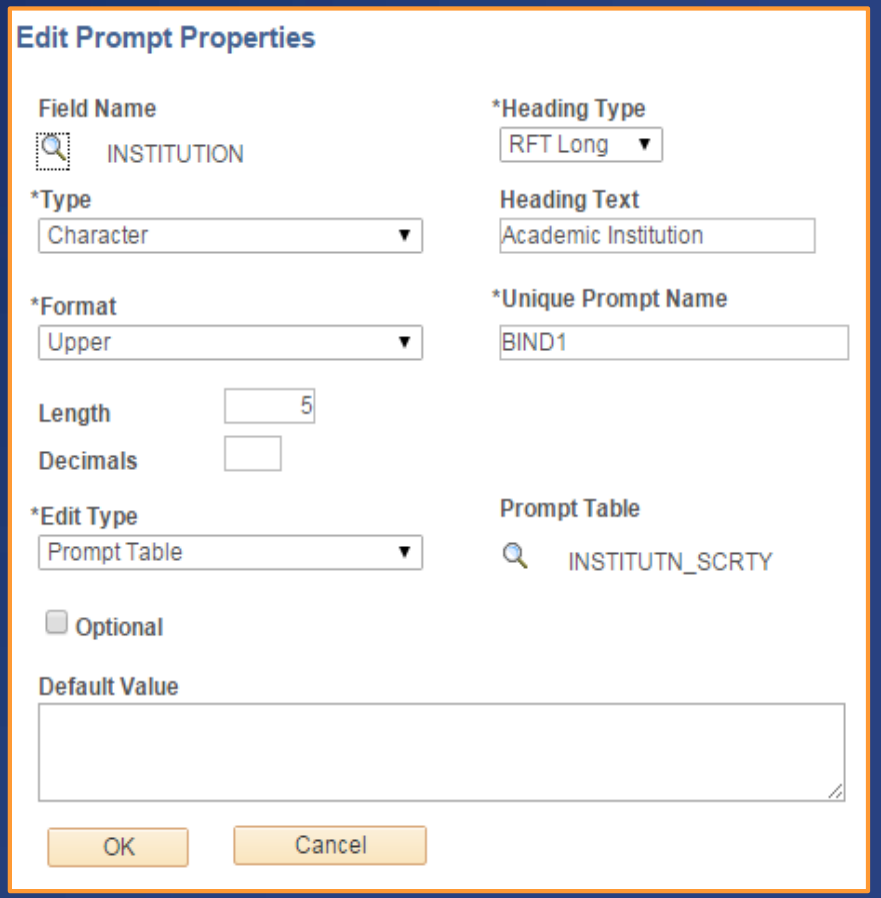
Prompts, Prompt Defaults, and Optional Prompts

- The Prompts page allows the user to attach runtime parameters to the query.
- Adding a prompt lets you further refine a query at the time of running it.
- To access the Edit Prompt Properties click the Add Prompt button or the Edit button on the Prompts page.
- **Note**: When using a prompt table on a field from a record definition with multiple keys, you must prompt for all higher-level keys before lower-level keys. PeopleSoft Query needs values for the higher-level keys to generate the correct prompt list.

Prompts, Prompt Defaults, and Optional Prompts

- Setting Prompt Properties:

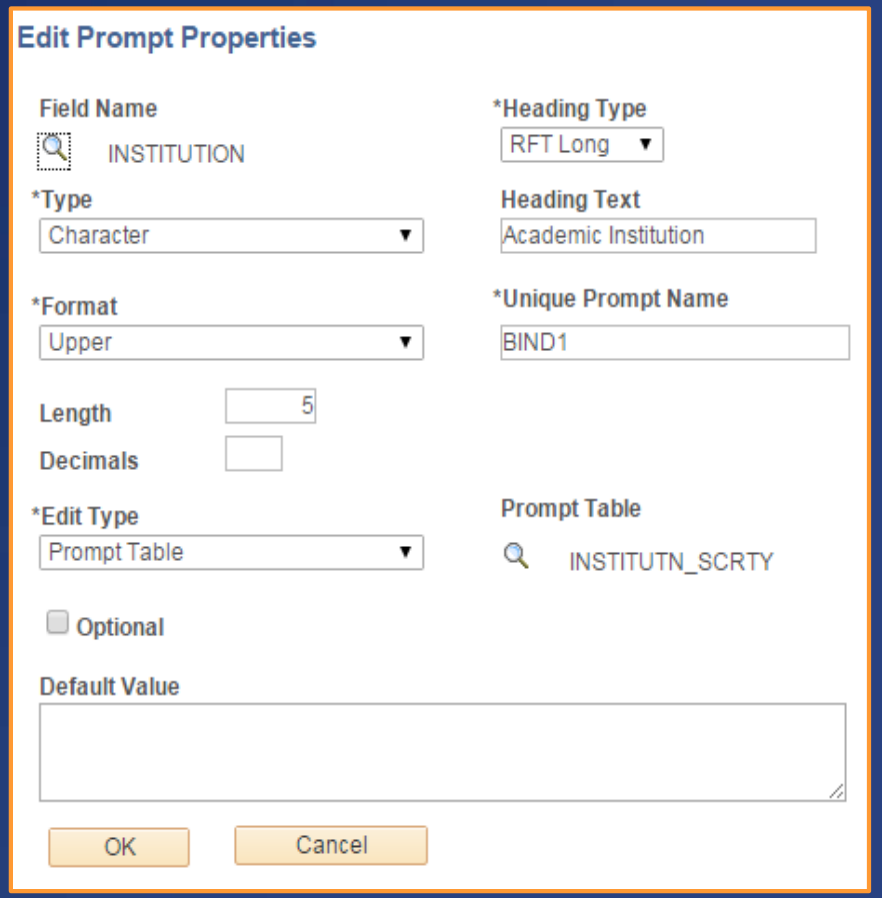
Page Object	*How Used*
Field	Click the Look Up button next to the Field Name field to select a prompt field. After you select a prompt field, the name of the field appears. PeopleSoft Query looks to the record definition for information about this field and completes the rest of the page based on its properties.
Type	Indicates the type of the field.
Format	Specifies the field format. Over a dozen formats are available, including Name, Phone, Social Security Number, and Zip Code.
Length	Indicates the field length.
Decimals	Defines the number of decimals that are allowed.
Edit Type	Defines the type of field edit for the specified field. No Table Edit is the default value. In general, you should use the same edit type that is used in the field record definition so that this edit type is consistent throughout
Heading Type	Select a heading type for the prompt from the following values: Text: The prompt heading is the free text that you have entered in the text box. RFT Short: The prompt heading is the short name from the record definition. RFT Long: The prompt heading is the long name from the record definition.



Prompts, Prompt Defaults, and Optional Prompts

- Setting Prompt Properties:

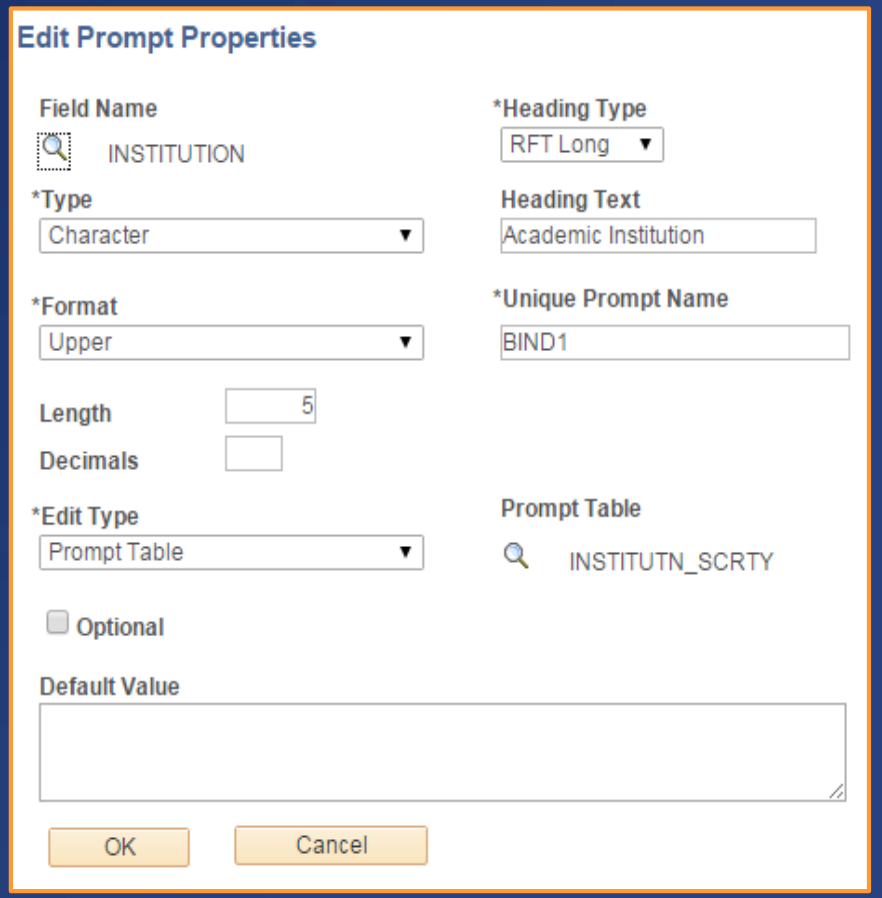
Page Object	*How Used*
Heading Text	Displays the label for the text box where you enter the comparison value. To change the text, select Text from the Heading Type drop-down list box, and then enter the new label in the Heading Text text box.
Unique Prompt Name	A default value that Query Manager generates for globalization. Only baselanguage users can set this value to uniquely identify a query prompt parameter
Prompt Table	If the edit type is Prompt Table, you can select a prompt table to use. If the edit type is Translate Table, the value in the drop-down list box determines the values used. PeopleSoft Query assumes that the specified field has translate table values associated with it, and that the field is identified as a translate table field in its record definition



Prompts, Prompt Defaults, and Optional Prompts

- Setting Prompt Properties:

Page Object	*How Used*
Optional	Use this option to define whether the prompt is optional or required. • Select this option to indicate that the query prompt is optional. When the prompt is set to optional, a query may return a large result set because results are not limited or restricted by a prompt value. • Clear this option to indicate that the query prompt is required. By default, the Optional option is cleared and a valid prompt value must be selected or entered when you run the queries that have prompts. **Note:** A required prompt value must be validated based on the Edit Type list. Prompt with the Edit Type set to Yes/No Table cannot be set as optional prompt because there are only two valid values, Y and N.
Default Value	Use this field to set a default value for the prompt. The value in this field is used to populate the prompt when no other prompt value is selected or entered. For character fields, you can add a default prompt value that has up to 254 characters long. **Note:** Entering a default value for a prompt set the prompt to required. If the Optional option is selected, when you enter a default prompt value for the prompt, the Optional option is cleared and a message appears saying: "Optional prompt cannot have default value. Prompt is now set to be required." Default prompt value is not a translatable field. Tree prompts cannot be used as the default or optional prompt values.



Seeing it in Action…

Prompts, Prompt Defaults, and Optional Prompts

PeopleSoft Query Writing: Advanced

Creating queries with Expressions, using SQL Functions, and Partitioning

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Expressions, using SQL Functions, and Partitioning

- Expressions are calculations that PeopleSoft Query performs as part of a query.
- Use them when you must calculate a value that PeopleSoft Query does not provide by default
  - for example, to add the values from two fields together or to multiply a field value by a constant.

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Expressions, using SQL Functions, and Partitioning

- You can work with an expression as if it were a field in the query:
  - Select it for output
  - Change its column heading
  - Choose it as an "order by" column.
- The result of an expression can be text, a date/time, a number, or URL and may be displayed and used in criteria as if it were a real field.

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Expressions, using SQL Functions, and Partitioning

- In Query Manager, you can use expressions in two ways:
  - As comparison values in selection criteria.
  - As columns in the query output.
- Fields from records can be used in expressions by using their actual name, not their description and preceding the name with their alias and a period. Prompts can be used in expressions by using a colon followed by the prompt number, such as “:1”.

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Expressions, using SQL Functions, and Partitioning

- One type of calculation that can be performed is mathematical.
- Standard mathematical order of operations (multiplication and division are done before addition and subtraction; computation goes from left to right) is used.
  - Parentheses can be used to group calculations together and force them to be done out of this order. You can add, subtract, multiply and divide numeric values. The mathematical operators are:
    - + (addition)
    - - (subtraction)
    - * (multiplication)
    - / (division)

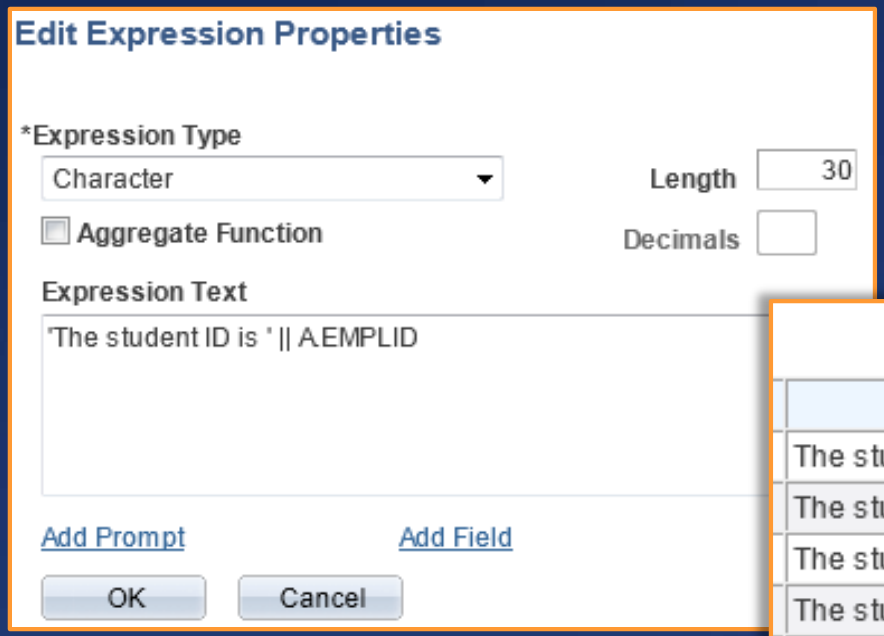
Expressions, using SQL Functions, and Partitioning

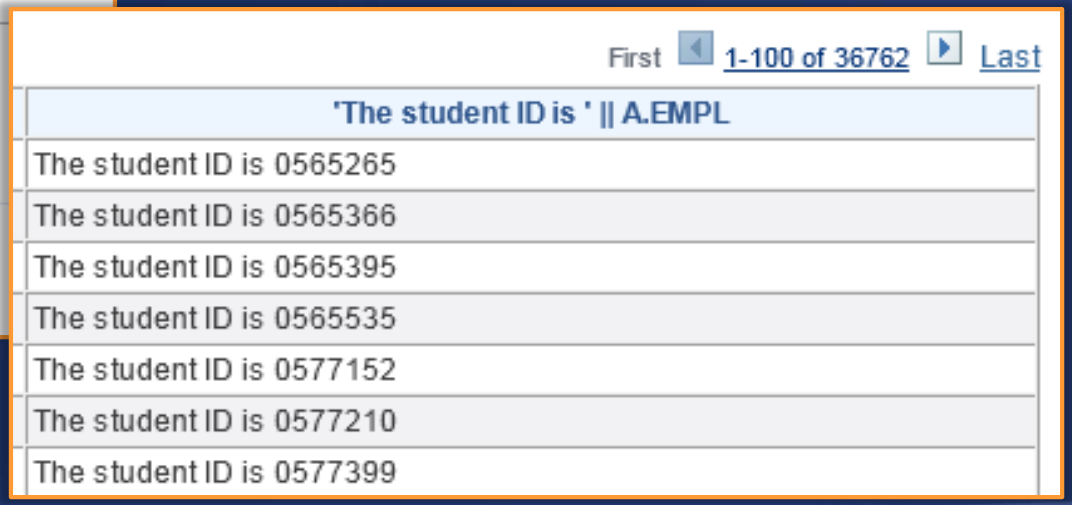
- Expressions can also contain Functions, which take some input values and return an output value.
- Functions operate similar to how they do in mathematics. Functions in expressions are of the form FUNCTION_NAME(arg1, arg2, …, argN), where FUNCTION_NAME is the name of the function and arg1, arg2, etc. are its arguments, which are the input values.

Expressions, using SQL Functions, and Partitioning

- When using a function in an expression, the name must be spelled exactly as expected, the argument list must be enclosed in parentheses, all arguments must be separated by commas, and all required arguments must be given. (There are sometimes optional arguments.)
- Functions that can be used in PeopleSoft Query Expressions are based on the version of the database platform the PeopleSoft application runs on.

Expressions, using SQL Functions, and Partitioning





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Expressions, using SQL Functions, and Partitioning

- Setting Expression Properties

Page Object	*How Used*
Expression Type	Identifies how the resulting data output should be read.
Length	For character and numeric expression types, enter the total number of digits the expression should have. For Number and Signed Number, expression types, the Length field defines the total length of the number (integer portion + decimals portion). For example, if Length = 10 and Decimals = 3, then this means that the integer portion = 7 (Length - Decimals = Integer).
Decimals	Identifies the number of digits that should fall behind the decimal point.
Aggregate Function	If you are entering an aggregate value, such as SUM, AVG, or COUNT, select the Aggregate Function check box. If you put an aggregate function into an expression, you must check the Aggregate Function checkbox, or you will receive the error “not a single-group group function.” This is indicating that you are trying to use an aggregate function on results that are not being aggregated.

Expressions, using SQL Functions, and Partitioning

- Setting Expression Properties

Page Object	*How Used*
Expression Text	In the Expression Text field, enter the expression. Query Manager inserts the expression into the SQL for you..
Add Prompt	Click the Add Prompt button to add prompt properties for this expression.
Add Field	Click the Add Field button to add fields to the expression.
OK	Click the OK button to have Query accept the expression.
Cancel	Click the Cancel button to cancel the current edits made to the epression.

Expressions, using SQL Functions, and Partitioning

- Analytic functions compute an aggregate value based on a group of rows. They differ from aggregate functions in that they return multiple rows for each group. The group of rows is called a window.
- Analytic functions are the last set of operations performed in a query except for the final ORDER BY clause. All joins and all WHERE, GROUP BY, and HAVING clauses are completed before the analytic functions are processed.
- Analytic functions are commonly used to compute cumulative, moving, centered, and reporting aggregates.
- Calculations are independent of output.

Expressions, using SQL Functions, and Partitioning

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- Calculations are independent of output.

Expressions, using SQL Functions, and Partitioning

- Syntax:
  - […..] (…..) OVER (PARTITION BY …..)
  - ….. (…..) OVER (PARTITION BY …..)
  - ….. () OVER ()
  - ….. (…..) OVER (PARTITION BY ….. ORDER BY ….. DESC)
    - ASC | DESC Specify the ordering sequence (ascending or descending)
    - ASC is the default
  - ….. (…..) OVER (PARTITION BY ….. ORDER BY ….. DESC NULLS LAST)
  - NULLS LAST is the default for ascending order.
  - NULLS FIRST is the default for descending order
- Examples:
  - COUNT (A.EMPLID) OVER (PARTITION BY A.STRM)

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Expressions, using SQL Functions, and Partitioning

- Examples…
  - COUNT (A.EMPLID) OVER (PARTITION BY A.ACAD_LEVEL_BOT)
  - COUNT (DISTINCT A.EMPLID) OVER (PARTITION BY A.ACAD_LEVEL_BOT)
  - COUNT (DISTINCT A.EMPLID) OVER (PARTITION BY A.ACAD_LEVEL_BOT, A.STRM)
  - SUM (A.UNT_TAKEN_PRGRSS) OVER (PARTITION BY A.EMPLID)
  - ….. (…..) OVER (PARTITION BY A.ACAD_LEVEL_BOT ORDER BY A.CUM_GPA DESC)
  - (PERCENT_RANK () OVER (PARTITION BY A.ACAD_LEVEL_BOT ORDER BY A.CUM_GPA DESC)) * 100
  - PERCENT_RANK () OVER (PARTITION BY A.ACAD_LEVEL_BOT ORDER BY A.CUM_GPA DESC)
  - ROW_NUMBER( ) OVER ([query_partition_clause] order_by_clause)

Seeing it in Action...

Expressions, using SQL Functions, and Partitioning

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PeopleSoft Query Writing: Advanced

Joining Multiple Tables, working with Effective Date outer joins

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Joining Multiple Tables, working with Effective Date outer joins

- Query Manager enables you to create queries that include multiple-table joins. Joins retrieve data from more than one table, presenting the data as if it came from one table. PeopleSoft Query links the tables, based on common columns, and links the rows on the two tables by common values in the shared columns.
- Joins are what make relational databases relational. Using joins, you define relationships among fields when you query the records, not when you create the records. Because PeopleSoft records are highly normalized (they each describe one kind of entity), you can easily use Query Manager to create joins.

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Joining Multiple Tables, working with Effective Date outer joins

- The procedure for joining tables differs depending on how the tables that are being joined are related to each other.
- The categories of joins focus on what relationships exist between records that will be connected in a query. Query Manager recognizes three categories of joins:
  - Record Hierarchy
  - Related Record
  - Any Record

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Joining Multiple Tables, working with Effective Date outer joins

- The types of joins focus on how records are connected in a query. Query Manager recognizes two types of joins based on how the tables are related to each other, they are:
  - Inner joins (aka Standard Join)
  - Outer joins (aka Left Join and Left Outer Join)
- Key to creating queries with joins is identifying the appropriate data elements (fields) that must be connected in the query

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Joining Multiple Tables, working with Effective Date outer joins

- Record Hierarchy Joins connects a parent table to a child table. A child table is a record that uses all the same key fields as its parent plus one or more additional keys
- To create Record Hierarchy joins, click on the 'Hierarchy Join' link next to the field having a hierarchal relationship in the Query tab. Then click on the link of the record you want to perform the hierarchal join on.
  - All of the records that have a parent/child relationship with the base record you've selected will be listed (the parent/grandparent of that record will be listed as well as the children/grandchildren of that record will be listed).

Joining Multiple Tables, working with Effective Date outer joins

- Note: For the record hierarchy relationships to show up in the Query Tool, the developers have to set up that relationship when designing the records. If a developer does not set up the relationship, it will not show up in the Query Tool.
- Note: When you create a Record Hierarchy join, PeopleSoft Query automatically adds an "Inner Join" criteria between the tables on key fields. The hierarchy criteria is embedded within the SQL statement generated by the query; you cannot make changes to the hierarchy criteria and must click on the SQL tab to see the embedded criteria.

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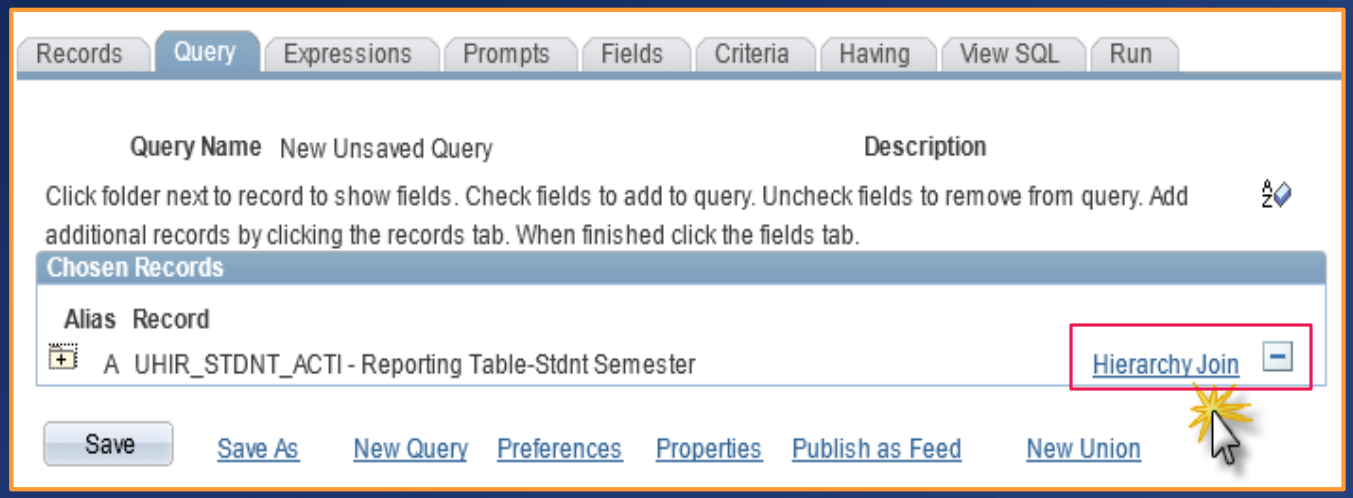
Joining Multiple Tables, working with Effective Date outer joins

- *Record Hierachy Join:*



Joining Multiple Tables, working with Effective Date outer joins

- Related Record joins connects records that have been predefined by the developer to show a relationship with each other based on a specific field in the table. Those predefined relationships for fields are indicated in the Query Tool by a link on the right hand side of the field in the Query tab.
- Related Record join functionality is very useful in quickly identifying and incorporating additional fields of data from unknown master tables into the query definition.

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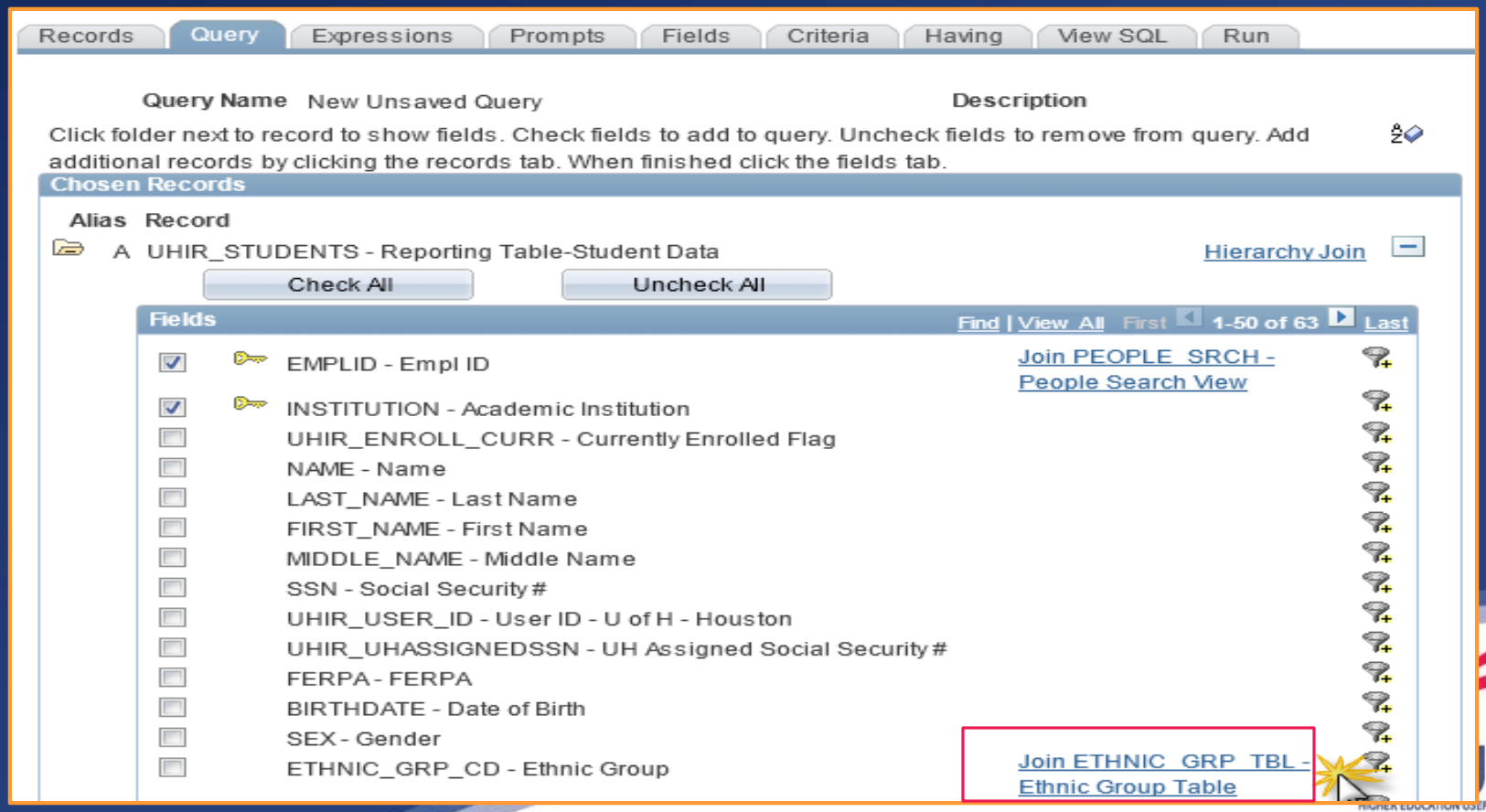
Joining Multiple Tables, working with Effective Date outer joins

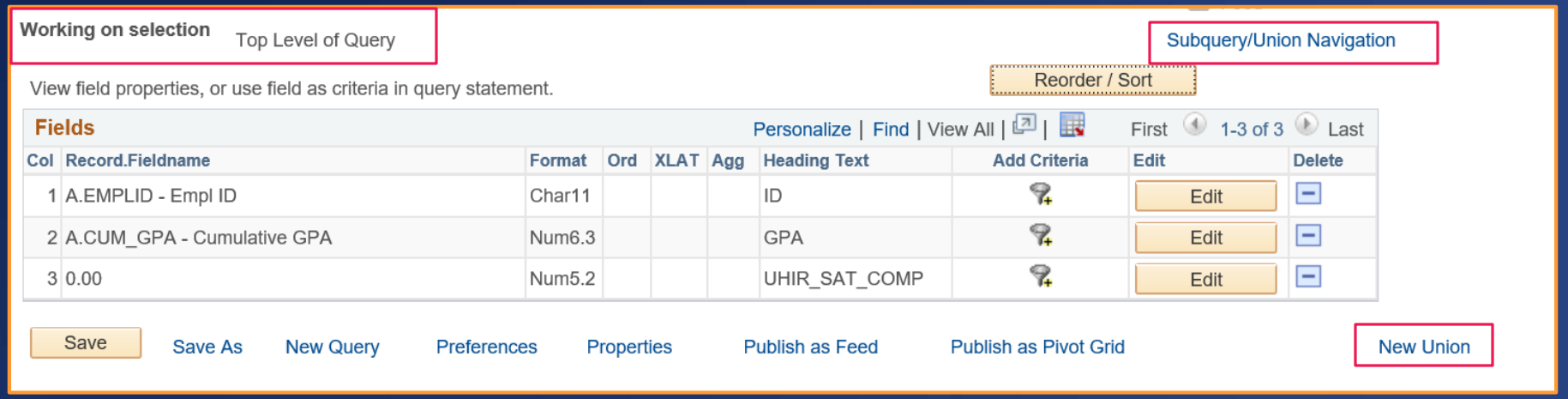
- To create Related Record joins, click on the record hyperlink next to the field having a related record relationship in the Query tab.
- Related Record join functionality allows the user to specify if they want the additional table to be added as either an Inner join or Outer Join. However note: the added criteria is embedded within the SQL statement generated by the query; you cannot make changes to the related record criteria and must click on the SQL tab to see the embedded criteria.

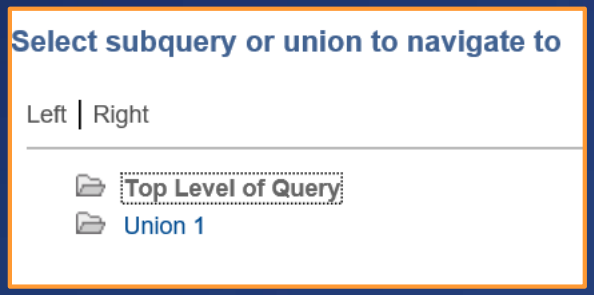
Joining Multiple Tables, working with Effective Date outer joins

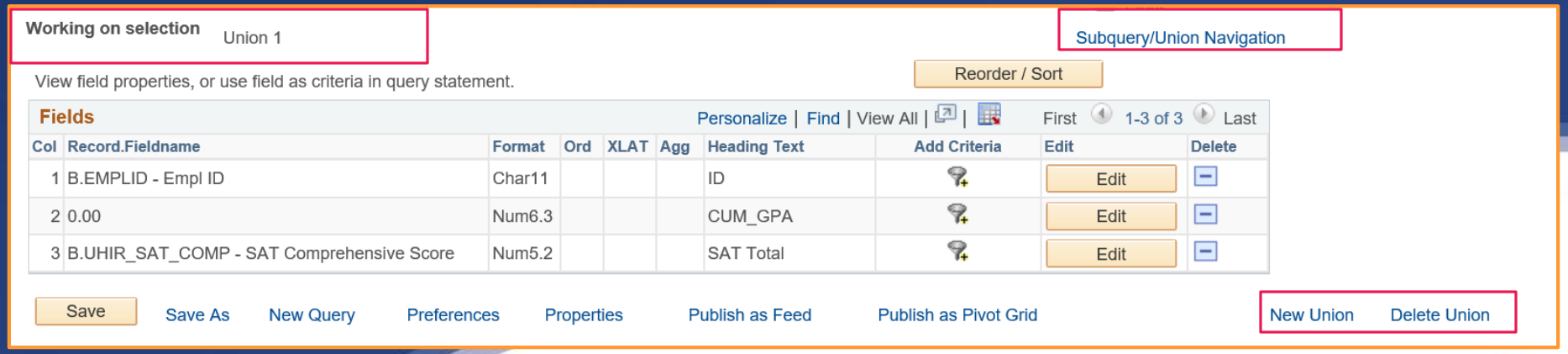
- *Related Record Join:*



Creating Queries with Unions







Seeing it in Action...

Creating Queries with Unions

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PeopleSoft Query Writing: Advanced

Query Administration

Query Administration

- PeopleSoft offers an administrative feature for users who may have oversight or involvement for monitoring query activity.
- The Query Administration component is located via navigation PeopleTools > Utilities > Administration > Query Administration
- Users are able to perform administrative actions such as assign a query to another user (handy when terminated employees have private queries that another user desires), delete a query, rename a query, move a query to a folder, turn logging on/off for a query, track execution stats for queries, and set query statistics and timeout options.

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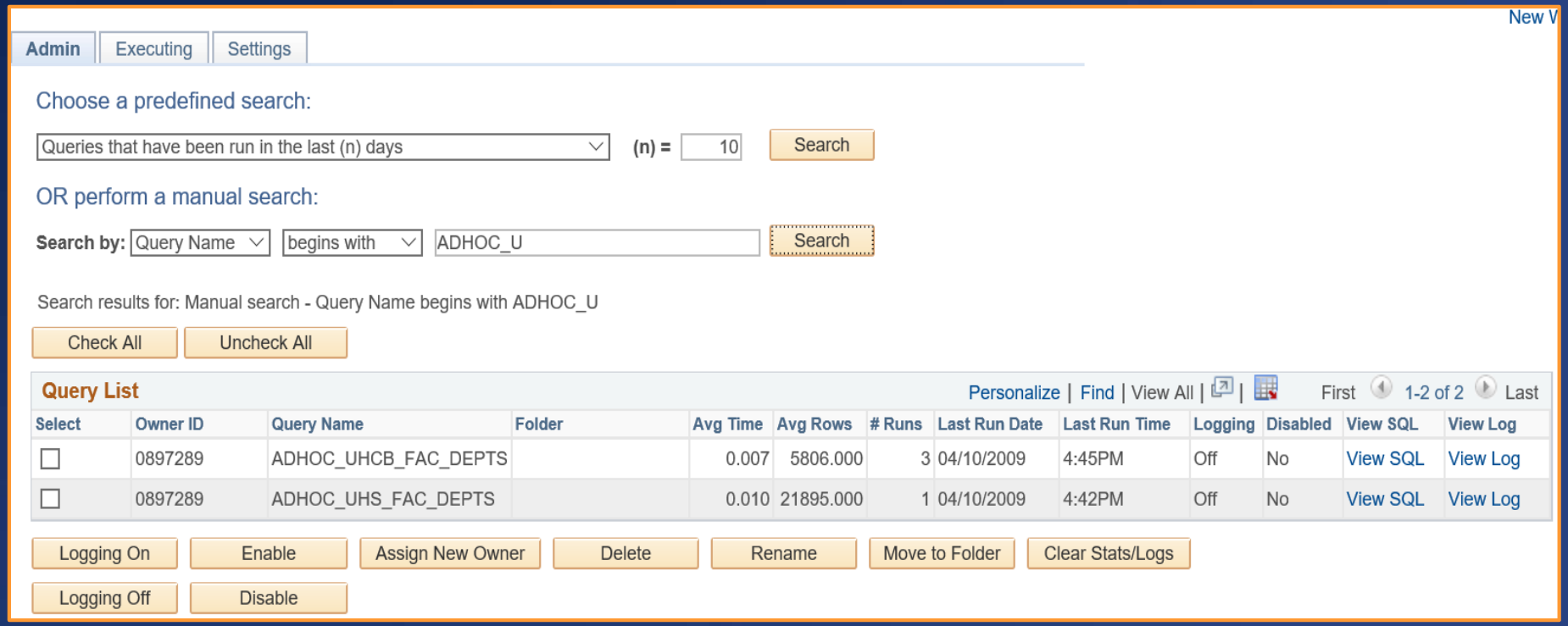
Query Administration



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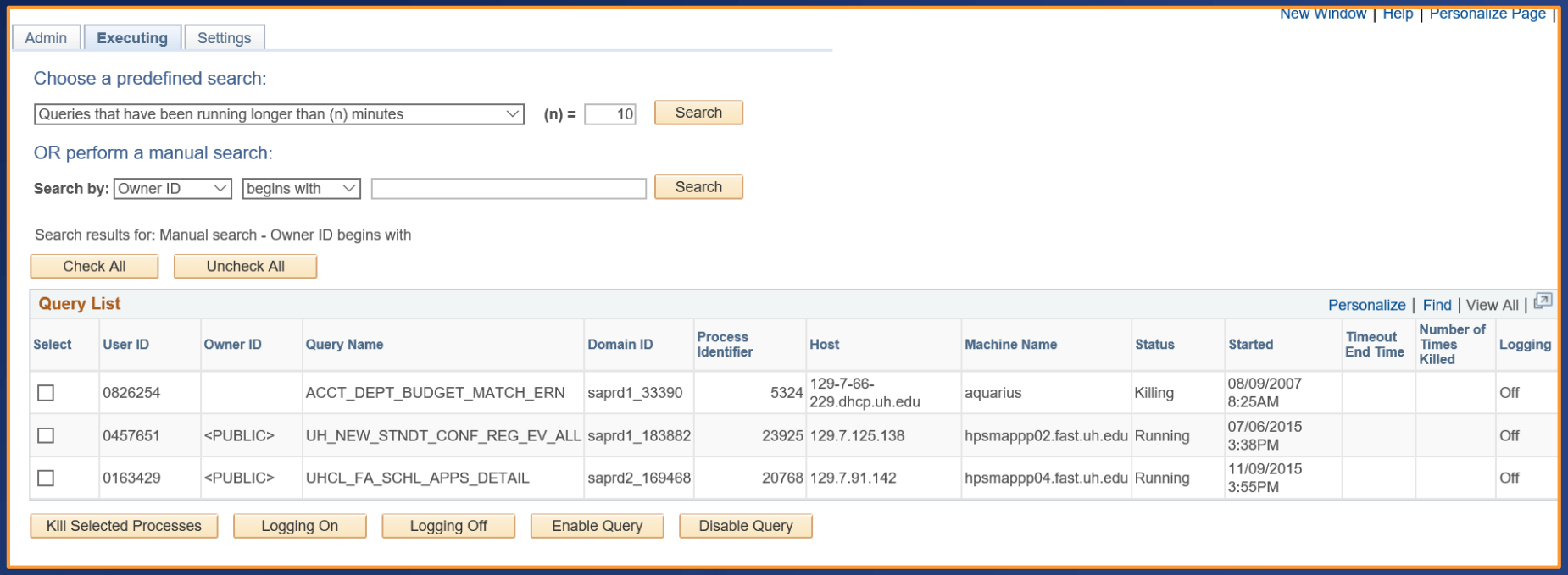
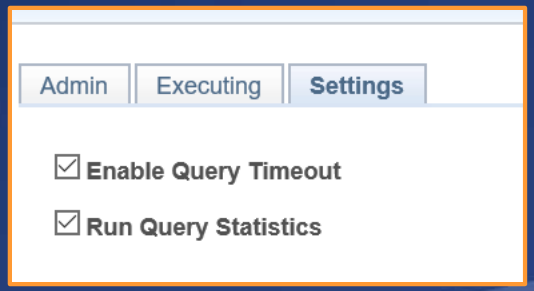
Query Administration





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Seeing it in Action...

Query Administration

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Questions?

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