Technical Bulletin

Using Totals for Data Analysis

Product:	ARPEGGIO™	**Host:**	N.A.
	R&R Report Writer® for	**NIC:**	N.A.
	Windows®	**Interface:**	N.A.
Version:	All	**Oper Sys:**	Microsoft® Windows® NT®

Summary

The SUM, COUNT, and AVERAGE commands can be used in R&R Report Writer reports for a variety of data analysis techniques. These include % of total calculations, subtotal averaging, queries on totals, and sorting and grouping on totals.

Using SUM, COUNT, and AVERAGE

Here is how the technique works. The SUM, COUNT, and AVERAGE commands are used to calculate grand totals or subtotals.

Let's begin with a simple report using the following example database. This database contains detailed records for each product sold by one of the Wall Data sales representatives. For simplicity, the data includes six sales reps and two products.

Structure for DETAIL Table

Field	Field Name	Type	Width
1	SALESREP	Character	6
2	PRODUCT	Character	3
3	QUANTITY	Numeric	3

Data for DETAIL table

Record#	SALESREP	PRODUCT	QUANTITY
1	Brenda	dBR	2
2	Ellen	R&R	6
3	Roger	dBR	1
4	Rob	R&R	2
5	Barry	R&R	1
6	John	R&R	10
7	Brenda	R&R	4
8	Ellen	dBR	4
9	Roger	R&R	4

Data for DETAIL table

10	Rob	dBR	1
11	John	dBR	5
12	Barry	dBR	4

One way to analyze this data is to simply total the quantity sold by each sales rep. This tells you how well each sales rep performed in absolute terms, but doesn't help you make a very thorough analysis.

You don't need to use the special totals techniques to produce this type of report. However, if you have access totals and subtotals and use these techniques, you can perform a much more thorough analysis as in the following report.

Sales Analysis Report

Sales Rep	Product	Quantity	% of Rep Total	% of Company Total
John	dBR	5	33%	12%
	R&R	10	67%	23%
		15	100%	34%
Ellen	dBR	4	40%	9%
	R&R	6	60%	14%
		10	100%	23%
Brenda	dBR	2	33%	5%
	R&R	4	67%	9%
		6	100%	14%
Barry	dBR	4	80%	9%
	R&R	1	20%	2%
		5	100%	11%
Roger	dBR	1	20%	2%
	R&R	4	80%	9%
		5	100%	11%
Rob	dBR	1	33%	2%
	R&R	2	67%	5%
		3	100%	7%
Totals:	**Sum**	44		100%
	Avg	7		

A better way to analyze the data is to sort sales reps in descending order of total quantity sold. This shows how well each sales rep performed in relation to the others. For example, you can see that John came out on top.

A thorough analysis should also present each sales rep's total as a % of the company total. This helps you see how well each sales rep performed not only in relation to the others, but also in relation to overall sales. For example, John contributed 34% of the company total.

You can further enhance your analysis by selecting key sales reps for inclusion on the report. For example a company average can be computed to provide a basis for comparison. In this example, the average sales rep sold 7 units.

You can then use a query to select above average, average, and below average sales reps. Including a % of total for each product helps identify factors contributing to each sales rep's relative success or failure.

As part of your sales analysis you may want to create another report by product rather than by sales rep. It would show you which products are most successful and, by including a % of total by product, show how much each product contributes to total sales.

Here are the steps you can follow to create the sample report.

1. Create report using the DETAIL table as the master file.

2. Specify the group field. Choose the Group Order command from the Database menu. Select the SALESREP field. To have the SALESREP name print once per group, click in the box below Print Once to place an "X" in that box.

3. Calculate the subtotal. Choose Calculations, Total Field to create a new total. Let's call this REPQTY. This will be a SUM of the QUANTITY field and will reset at the SALESREP group level. Since we will want to sort by this field, we must make it a pre-processed total. We can do this by choosing the Options button and click on the radio button for Pre-processed.

4. Calculate the grand total. This will be similar to REPQTY, except that the reset level will be Grand. You will still want to choose the Pre-processed option. Let's call this field GRNDQTY.

5. Specify the sort field. To print the sales reps in descending order of total quantity sold, use the Sort Order command to select REPQTY as the first sort field. Then click on the "X" near the word Ascending to change the order to Descending.

    Click in the second sort dialog and select PRODUCT as the second sort field to alphabetize the detail records by product.

    Create % of total calculations. You will create two % of total fields; one a % of the sales rep's total and the other a % of the company total. Using the Calculations Calculated Field command, enter the following calculated field expressions.

Pct_Reptot = QUANTITY / REPQTY
Pct_Cotot = QUANTITY I GRNDQTY

NOTE: You don't have to multiply by 100 since the Percent format can be applied to these fields once you insert them on the report format.

---

6. Create sales rep subtotals. Both of the % of total fields are subtotaled in the sales rep group footer, which is group level 1. The figure for % of sales rep total should always equal 100%. It is included to verify the accuracy of the Pct_Reptot field. Using the Calculations - Total Field command, enter the following total field definitions.

> Sub_Rep = Sum(Pct_Reptot, SALESREP, Every, Running)
> Sub_Co = Sum(Pct_Cotot, SALESREP, Every, Running)

7. Create company totals. The report summary contains a grand total of the quantity and the % of company total, which should always equal 100%. We already have the total quantity in the field of GRNDQTY we previously created. Using the Calculations - Total Field command, enter the following total field definition.

> Sum_Pct = Sum(Pct_Cotot, Grand, Every, Running)

8. Create the company average. The report summary also contains the average quantity sold by each sales rep. This is an example of subtotal averaging since the quantity sold by each sales rep is a subtotal derived from the detail records. Using the Calculations - Total Field command, enter the following total field definition.

> Avg_Qty = Average(REPQTY, Grand, Every, Running)

9. Create the report format. First use the Insert - Create Band Line command to insert a record line. Then insert the SALESREP, PRODUCT, QUANTITY, Pct_Reptot, and Pct_Cotot fields in the appropriate positions. Repeat Insert - Create Band Line to insert three SalesRep group footer lines and then three summary lines. On the first group footer line, insert the REPQTY, Sub_Rep, and Sub_Co fields under the appropriate columns. On the first summary line, insert the text "Totals:" and "Sum", and then place the Sum_Qty and the Sum_Pct under the appropriate columns. On the second summary line, insert the text "Avg" and the field Avg_Qty beside it.

10. Use the Format Field command to format all five % of total fields in percentage format and also specify the width as three integers, since they will never be more than 100%.

11. Define a filter. You can use a filter to select above or below average sales reps. As you saw in the complete report, the average sales rep sold 7 units. To select above average sales reps, use the Database - Filter command to enter the following filter using the REPQTY field.

> **REPQTY** is greater than 7

---

without warranty of any kind, either expressed or implied, but not limited to the implied warranty of merchantability and fitness for a particular purpose. Liveware Publishing may improve or change the product at any time without further notice; this document does not represent a commitment on the part of Liveware Publishing. The software described in this document is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of the licensing agreement.