crystal decisions™

Crystal Analysis

Dr. MDX Illustrates First Steps in Data Analysis

Dr. MDX Overview

Dr. MDX is a regular column in the Developer Zone section of the Crystal Decisions web site. Every two weeks the Doctor answers a reader's MDX problem and suggests some solutions.

MDX, short for Multi Dimensional Expressions, is a query language for accessing data from OLE DB for OLAP (ODBO) compliant servers, such as Microsoft SQL Server Analysis Services.

Column Overview

This column covers simple analysis calculations such as Averages (both mean and median) and finding minimum and maximum values. All of the examples are illustrated using Crystal Analysis Professional and the Sales cube in Microsoft's Foodmart 2000 sample.

Calculating Averages

Mean Values

Mean values are calculated using the MDX **Avg** function

```
Avg(«Set»[, «Numeric Expression»])
```

For example, if you may need to know the average product sales values for Male and Female customers in the Foodmart example, highlighting cases where each gender has bought more or less than the average. To calculate the average of the values for Male and Female, you can add the following calculation to the **Gender** dimension:

```
Avg({[Gender].[All Gender].[F],[Gender].[All Gender].[M]})
```

Figure 1 shows the Crystal Analysis Professional calculation expert with this calculation defined, while the result is shown in **Figure 2**.

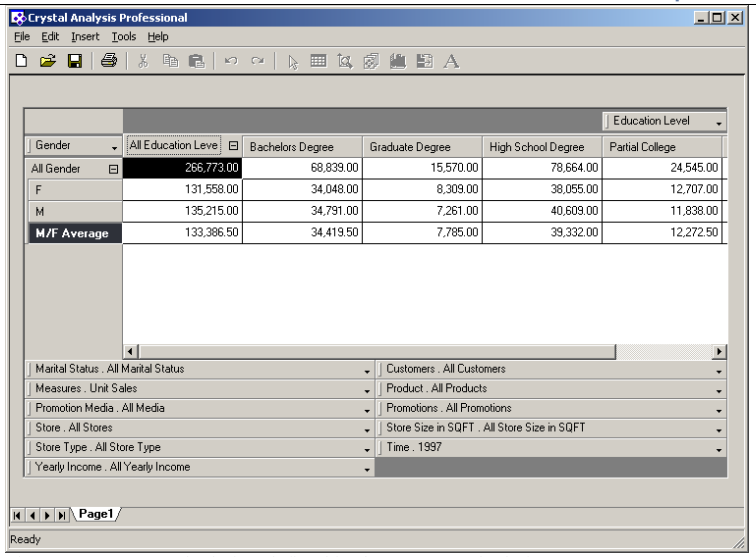

Figure 1: Average calculation defined in the CA Pro calculation expert

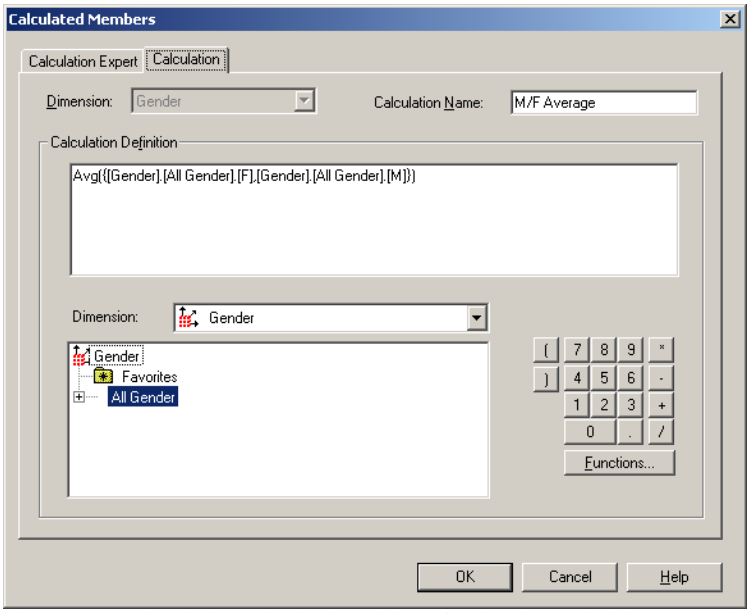

Figure 2: Crystal Analysis Professional worksheet showing the result of the mean value calculation

Calculating the mean over a period of time

The MDX **Avg** function actually takes two parameters. The first parameter is the set of members to calculate the average across, while the second specifies the value to average out. As an example, you could use this to calculate the average for the Sales measure over some period of time.

To create an average of sales for the four quarters in 1997, use the following calculation:

```
Avg({[Time].[1997].[Q1]:[Time].[1997].[Q4]},
[Store Sales])
```

Median Values

Median values are calculated using the MDX **Median** function

Median(«Set»[, «Numeric Expression»])

Usage is identical to the **Avg** function, so you can modify the calculations above as follows:

```
Median({[Gender].[All Gender].[F],[Gender].[All Gender].[M]})

Median({[Time].[1997].[Q1]:[Time].[1997].[Q4]},
[Store Sales])
```

Finding Maximum and Minimum Values

Maximum Values

The maximum values in a set of values is calculated using the MDX **Max** function

Max(«Set»[, «Numeric Expression»])

For example, to identify the best performance for a quarter in 1997, add the following calculation to the Time dimension:

```
Max({[Time].[1997].[Q1]:[Time].[1997].[Q4]})
```

Figure 3 shows the Crystal Analysis Professional calculation expert with this calculation defined, while the result is shown in **Figure 4**.

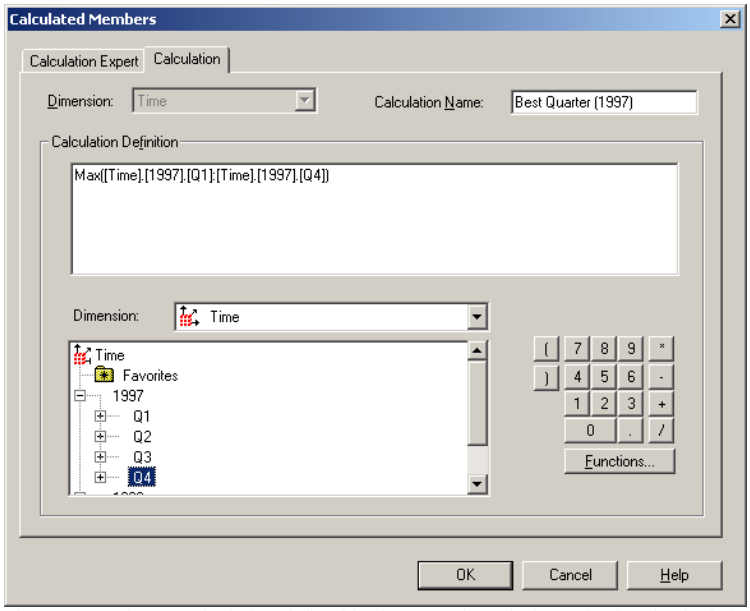

Figure 3: Maximum calculation defined in the Crystal Analysis Professional calculation expert

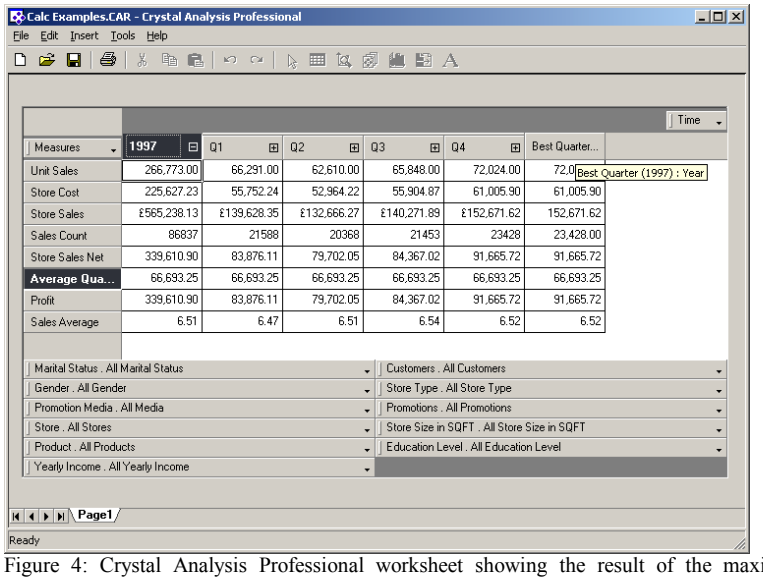

Figure 4: Crystal Analysis Professional worksheet showing the result of the maximum value calculation

Minimum Values

The minimum values in a set of values is calculated using the MDX **Min** function

Min(«Set»[, «Numeric Expression»])

You modify the Max example to show the worst performer just by substituting **Min** for **Max**:

```
Min({[Time].[1997].[Q1]:[Time].[1997].[Q4]})
```

Finding More Information

For more information on Crystal Analysis Professional and the Crystal Decisions family of business intelligence products, please visit:

- http://www.crystaldecisions.com/products
- http://support.crystaldecisions.com
- http://www.crystaldecisions.com/products/dev_zone

To view more Dr. MDX columns, please visit:

http://www.crystaldecisions.com/products/dev_zone/archives

Contacting Crystal Decisions for Technical Support

We recommend that you refer to the product documentation and that you visit our Technical Support web site for more resources.

Self-serve Support:
http://support.crystaldecisions.com/

Email Support:
http://support.crystaldecisions.com/support/answers.asp

Telephone Support:
http://www.crystaldecisions.com/contact/support.asp

Contacting Dr. MDX

Send your MDX questions to dr.mdx@crystaldecisions.com.