EXAMPLE - Statistical Functions

This example illustrates how you can apply statistical functions to your dataset. Calculations include average (mean), max, min, standard deviation, and variance.

Source:

Students took a test and recorded the following scores. You want to perform some statistical analysis on them:

Student	Score
Anna	84
Ben	71
Caleb	76
Danielle	87
Evan	85
Faith	92
Gabe	85
Hannah	99
Ian	73
Jane	68

Transform:

You can use the following transforms to calculate the average (mean), minimum, and maximum scores:

```
derive type:single value:AVERAGE(Score) as:'avgScore'
```

```
derive type:single value:MIN(Score) as:'minScore'
```

```
derive type:single value:MAX(Score) as:'maxScore'
```

To apply statistical functions to your data, you can use the VAR and STDEV functions, which can be used as the basis for other statistical calculations.

```
derive type:single value:VAR(Score)
```

```
derive type:single value:STDEV(Score)
```

For each score, you can now calculate the variation of each one from the average, using the following:

```
derive type:single value:((Score - avg_Score) / stdev_Score) as:'stDevs'
```

Now, you want to apply grades based on a formula:

Grade	standard deviations from avg (stDevs)
A	stDevs > 1
B	stDevs > 0.5
C	-1 <= stDevs <= 0.5

D	stDevs < -1
F	stDevs < -2

You can build the following transform using the `IF` function to calculate grades.

```
derive type:single value:IF((stDevs > 1),'A',IF((stDevs < -2),'F',IF((stDevs < -1),'D',IF
((stDevs > 0.5),'B','C'))))
```

For more information, see *IF Function*.

To clean up the content, you might want to apply some formatting to the score columns. The following reformats the `stdev_Score` and `stDevs` columns to display two decimal places:

```
set col:stdev_Score value:NUMFORMAT(stdev_Score, '##.00')
```

```
set col:stDevs value:NUMFORMAT(stDevs, '##.00')
```

```
derive type:single value:MODE(Score) as:'modeScore'
```

Results:

Student	Score	modeScore	avgScore	minScore	maxScore	var_Score	stdev_Score	stDevs	Grade
Anna	84	85	82	68	99	87.000000000 00001	9.33	0.21	C
Ben	71	85	82	68	99	87.000000000 00001	9.33	-1.18	D
Caleb	76	85	82	68	99	87.000000000 00001	9.33	-0.64	C
Danielle	87	85	82	68	99	87.000000000 00001	9.33	0.54	B
Evan	85	85	82	68	99	87.000000000 00001	9.33	0.32	C
Faith	92	85	82	68	99	87.000000000 00001	9.33	1.07	A
Gabe	85	85	82	68	99	87.000000000 00001	9.33	0.32	C
Hannah	99	85	82	68	99	87.000000000 00001	9.33	1.82	A
Ian	73	85	82	68	99	87.000000000 00001	9.33	-0.96	C
Jane	68	85	82	68	99	87.000000000 00001	9.33	-1.50	D