Computing Data Using Count (CNT)

Description

Use the Count (CNT) function to analyze and summarize data. Based on key fields, the function computes subtotals, percentages, averages, entry counts, and more.

Advantages

The Count function has several advantages over other MAPPER functions. These include the ability to

- Subtotal fields without having to sort them first.
- Perform calculations on a single report or across an entire drawer.
- Process more than one distinctly different set of analyses with one function request.
- Reduce processing time in two ways. You can replace a sequence of two or more other functions with the Count function. The function scans the report in one pass no matter how many analyses you request.

Computing Data Using Count (cont.)

What You Can Do with Count

- Count the number of unique entries in key fields.
- Calculate the subtotal, average, minimum, or maximum value for each unique key.
- Compute the percentage of entries in a certain key of the total number of entries.
- Compute the percentage that each subtotal field is of the grand total.
- Numerically round each requested field separately.
- Perform calculations based on numeric, date, or time intervals.
- Display only specified fields in the result.

Count Function Outcome

Result Displayed

A result is displayed with the completed calculations.

One-line Summary

The result contains a one-line summary of each unique key.

Sorted by Key Field

The result is sorted by key field(s) in ascending order.

Nonreferenced Fields

All nonreferenced fields are filled with spaces.

Invalid Data

When an invalid key is encountered in the input report, the entire line is omitted from calculations. When invalid data is encountered in a nonkey field, the value is considered to be zero for numeric operations; January 1, 1944, for date calculations; or 00:00:00 for time operations.

Using Key Fields and Parameters in Count

How Count Works

The Count function groups identical values in the key field together and performs calculations for each group, or key.

Specifying Key Fields

Specify key fields by placing parameters, 1 through 9, in the appropriate fields in the function mask. You must specify at least one key field for each set of parameters.

Specifying Fields to Operate On

Specify fields to operate on by placing parameters in appropriate fields in the function mask. For example, put an equal sign (=) in the field you want to load with the number of times a unique key value occurs.

See Examples

See the related screens that describe key fields, parameters, and operators. Also see the related Count function examples.

Count Function Key Field Parameters

Key Field Description

Key fields contain data to be grouped together. You perform calculations on fields based on the key parameters you enter in the key field.

Key field parameters are the numbers 1 through 9, where 1 is the most significant. You can begin with a number other than 1. Always specify at least one key field for each set of parameters. The following are types of key fields:

Alphanumeric Key Fields

Used to specify character data. Use a single digit, 1 through 9. By default, upper and lowercase characters are considered equal.

Numeric Key Fields

Used to specify numeric fields. Use a key number and the parameter N; for example, 1N. Numbers can be left or right justified.

Count Function Date and Time Formats

Date and Time Key Fields

Used to specify date or time fields. Use a key number, the parameter D or T, and a date or time format number. For example, 1T0 indicates a key field containing times in format 0, HH:MM:SS. Following are the date and time format numbers.

Date Format Numbers

Number	Format	Number	Format	Number	Format
0	YMMDD	3	YDDD	6	MM/DD/YY
1	YYMMDD	4	YYDDD	7	MONTH DD,YYYY
2	DD MMM YY	5	DDMMYY	8	MMDDYY

Time Format Numbers

Number	Format
0	HH:MM:SS
1	HH:MM
2	HHMMSS
3	HHMM

Count Function Constant-Label Key Field Parameters

Description — Unlike key fields that refer to the contents of a report field, constant-label key fields ignore field data. Instead, they represent execution-time values.

Report Key — Use report key parameters only when processing an entire drawer or range of reports. With report keys, you use the report number as a key and perform computations based on each report.

Specify a report key with a parameter containing a key number and the parameter R, for example, 1R. The key field is loaded with the report number, and changes with each processed report.

Line Key — Use line keys to match output and input lines. Specify a line key with a key number and the parameter L, for example, 1L. The line key field, loaded with the input report line number, changes with each processed line.

Count Function Operators

Entry Count (=) — Counts the number of entries for each unique key.

Cumulative Count (=+) Displays cumulative count of entries.

Subtotal (+) — Subtotals values for each unique key in the key field.

Cumulative Subtotal (++) Displays cumulative subtotals in the key field.

Percentage (%) — Provides the entry counts for unique keys expressed as a percentage of the total entries in the field.

Cumulative Percentage (%+) Displays cumulative entry counts expressed as a percentage of total entries in the field.

Count Function Operators (cont.)

Subtotal Percent (+%) — Expresses the subtotal for each unique key as a percentage of the grand total value of the field. See the related screen "Count Example: Finding Percentages of Grand Totals."

Cumulative Subtotal Percentage (+%+) Displays cumulative subtotals expressed as a percentage of the grand total value of the field.

Average (/) — Computes the average by subtotaling values and dividing by the number of entries.

Delete Field (-) — Excludes values in a field from a result.

Count Function Operators (cont.)

Minimum (<) or (<Dn) or (<Tn) — Computes minimum value for each unique key. For date or time entries use <Dn or <Tn; n is the date or time format. See the related screen "Count Function Date and Time Fields and Formats." For example, <D1 finds the earliest

date for each key (in format number 1, YYMMDD).

Maximum (>) or (>Dn) or (>Tn)

Computes maximum value for each unique key. For date or time entries use >Dn or >Tn; n is the date or time format. See the related screen "Count Function Date and Time Formats." For example, >T0 finds the latest time for each unique key (in format 0, HH:MM:SS).

Count Function Operators (cont.)

Standard Deviation (!-) or (!+)

Computes standard deviation for a numeric field. Following are the operators and formulas used in calculating standard deviation (n = entry count, and x = numeric field).

For Sample: !- SQRT((SUM(x**2)/(n-1))-(SUM(x)*SUM(x)/(n*(n-1))))

For Population: !+ SQRT((SUM(x**2)/(n))-(AVG(x)*AVG(x)))

Variance (!!-) or (!!+)

Computes the variance for a numeric field. Following are the operators and formulas used in calculating variance; n = entry count and x = numeric field.

For Sample: !!- ((SUM(x**2)/(n-1))-(SUM(x)*SUM(x)/(n*(n-1)))

For Population: !!+ ((SUM(x**2)/(n))-(AVG(x)*AVG(x))

Count Function Constant-Label Operators

Description

Constant labels (:R, :L, and :M) load fields with data extracted at execution time from one report or a range of reports. Use these parameters to extract and display information about fields other than key fields.

Report Number (:R)

Places the input report number into the field.

Line Number (:L)

Loads the field with the input report line number.

Multiple Analysis Number (:M)

Loads the field with the corresponding analysis number. If you use more than one set of parameters (perform more than one analysis) in a function request, the function creates a single result containing output from all of the analyses. This operator (:M) loads the specified field with the number of the analysis that is the source of the output line. For example, output lines created by the first set of parameters are loaded with a value of one.

Sample Report Used in Count Function Examples

Sample Report

This sample report is used in Count function examples in the following screens. It lists the location, date, and time of systems that have gone down. It also lists the number of hours that the systems were down, the cause code, and the cost of the down time.

*Location.	Date .	Time	.Down.	Cause.	Value	Cost	.Count.	%
Chicago	890221	05:00:32	2.2	CODE1		550		
Boston	890424	03:00:45	.5	Code3		40		
Chicago	890607	09:00:23	1.3	Code2		2900		

```
New York 890607 11:47:47  1.0  Code2                10
Boston   890708 14:31:02  0.5  Code1                55
Boston   890708 08:24:01  0.1  Code2                 9
Chicago  890930 18:45:02  4.0  Code3              7500
Chicago  891130 23:24:00  0.7  Code2                20
Boston   891202 03:05:09    1  Code2               900
```

Count Example: Counting Keys and Calculating a Percentage

Description

This example counts the times each unique key appears in the key field and calculates the percentage of total down-time events for each location.

Function Mask

```
*Location.Date  .Time  .Down. . . .Count.  %
*========.======.======.====. . . .=====.=====
 1                                    =     %
```

Parameters Used

- 1 Indicates the key field.
- = Identifies where to place the calculation of the number of times a city had down time.
- % Identifies the where to place the percentage of times the city had a down-time event.

Result

```
*Location.Date  .Time  .Down. . . .Count.  %  .
*========.======.======.====. . . .=====.=====.
 BOSTON                                  4  44.4
 CHICAGO                                 4  44.4
 NEW YORK                                1  11.1
```

Count Example: Subtotaling and Averaging

Description

This example subtotals the number of hours each system was down for each cause code and averages the cost for each cause.

Function Mask

```
*Location. . . .Down. Cause.  Value    .  Cost    . . .
*========. . . .====.======.==========.=========. . .
                 +    1                  /
```

Parameters Used

- 1 Indicates the key field.
- + Subtotals the amount of down time for each cause.
- / Calculates the average cost of each cause's down-time.

Result

```
*Location. . . .Down. Cause.  Value      Cost    . . .
*========. . . .====.======.==========.=========. . .
                 2.70  CODE1            302.50000
                 4.10  CODE2            767.80000
                 4.50  CODE3                 3770
```

Count Example: Rounding

Description

This example shows how to round each result field. Enter an R in the first column of the line below the parameters. Enter the rounding value under each field to round. Use the same rounding values as for the Calculate (CAL) function. This example builds on the previous example of subtotaling and averaging by rounding subtotal values to the nearest tenth and by rounding average values to the nearest hundredth.

Function Mask

```
*Location. . . .Down. Cause.  Value    .  Cost    . . .
```

```
*========. . . .====.======.==========.=========. . .
             +    1                    /
R            .1                        .01
```

Result

```
*Location. . . .Down. Cause.  Value    .  Cost    . . .
*========. . . .====.======.==========.=========. . .
                 2.7  CODE1                 302.50
                 4.1  CODE2                 767.80
                 4.5  CODE3                3770.00
```

Count Example: Vertical Cumulation

Description

To produce a vertical cumulation, add a plus sign (+) following another operator in that field.

Function Mask

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
 1               =    =+     +%          +%+
```

Parameters Used

1 Indicates the key field.
= Specifies the field in which to display the number of times each unique key occurs.
=+ Specifies the field in which to display the vertical cumulative entry count of the keys.
+% Calculates the percent of the total cost for each unique key.
+%+ Specifies the field in which to place the vertical cumulative percent cost of each unique key.

Count Example: Vertical Cumulation (cont.)

Description

Following is the result of the previous vertical cumulations.

Result

```
*Location. . . .Down. Cause.  Value    .  Cost    . . .
*========. . . .====.======.==========.=========. . .
 BOSTON             4      4   44.44444  44.44444
 CHICAGO            4      8   44.44444  88.88889
 NEW YORK           1      9   11.11111 100.00000
```

Interpretation

- Chicago experienced 4 down-time events.
- The cost of the down-time event in New York was 11.11111 percent of the total cost of down time events.
- Boston and Chicago together made up 88.888889 percent of the total cost for down times.
- For all three locations, systems went down a total of 9 times.

Count Function: Extraction Parameters

Description

Ordinarily, only key fields and fields involved in operations are included in a Count result. If you use extraction parameters, however, you can include the contents of other fields as well. An extraction parameter is a single letter placed in a field. Do not label more than one field with the same letter. By default, extraction fields are loaded from the report line where each unique key occurs the first time.

Using Extraction Parameters

See these related screens for more uses of extraction parameters: "Count Example: Placing Result Values in a

Selected Field" and "Count Example: Performing Multiple Operations on a Single Field."

Exclusion Parameter

The exclusion parameter is a minus sign following the extraction parameter and indicates that the field should be excluded from the result. Use this operator only with labeled fields. For example, A- labels a field as A, but does not include the contents of the field in the result.

Count Example: Placing Result Values in a Selected Field

Function Mask

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
 1              A           +A
```

Parameters Used

1 Indicates the key field.
A Labels the field as A and extracts data for display. The value displayed in the Down field is the first value associated with the key in the input report.
+A Calculates Down field subtotals (labeled as A).

Result

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
 BOSTON           .5        2.10000000
 CHICAGO         2.2        8.20000000
 NEW YORK        1.0                 1
```

Note

If A- (a label and the exclusion parameter) had been placed in the Down field, the values in that field would have been excluded from the result.

Count Example: Performing Multiple Operations on a Field

Function Mask

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
 1              A+          /A
```

Parameters Used

1 Indicates the key field.
A+ Labels the Down field as A, calculates the total down time for each Location, and places the subtotals in the Down field.
/A Calculates the average down time for each location and places the values in the Value field.

Result

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
 BOSTON          2.10        0.52500000
 CHICAGO         8.20        2.05000000
 NEW YORK           1                1
```

Count Example: Finding Percentages of Grand Totals

Function Mask

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
 1              +%                     %+
r               .1                     1
```

Parameters Used

1 Indicates the key field.
+% Computes, for each location, the number of hours down expressed as a percent of the grand total hours down.
%+ Calculates, for each location, the number of down-

time events expressed as a percent of total number of down-time events. Displays the cumulative percent.

r Rounds result fields as specified (Down is rounded to tenths [.1], Cost is rounded to units [1]).

Result

*Location. . . .	.Down.	Cause.	Value	.	Cost	. . . .
BOSTON	18.6				44	
CHICAGO	72.6				89	
NEW YORK	8.8				100	

Performing Multiple Analyses in a Single Pass

Description

Using more than one set of parameters (performing more than one analysis) in a single function request creates a single result containing output from each analysis.

Function Mask

*Location. . . .	.Down.	Cause.	Value	.	Cost	. . . .
1	A/				+A	
=		1				

First Set of Parameters Used

1 Specifies the key field.

A/ Labels the Down field as A, calculates the average hours down for each location, and places the values in the Down field.

+A Calculates the total number of hours down for each location and places the values in the Cost field.

Second Set of Parameters Used

= Counts the number of times each cause occurred. In other words, counts the number of times each unique key appears in the key field.

1 Specifies the key field.

Performing Multiple Analyses in a Single Pass (cont.)

Result

This is the result of the previous calculation. Note that the .EJECT command appears between each analysis output.

*Location.	Date .	Time	.Down.	Cause.	Value	Cost	.Count.	%
BOSTON		0.53			2.1000000			
CHICAGO		2.05			8.2000000			
NEW YORK		1				1		

```
.DATE 03 MAY 90  20:10:02  RID     21A   03 MAY 90  NEWUSER
.Count Practice Report                                    BY: MAPCOORD
*Location. Date .  Time  .Down. Cause.  Value      Cost   .Count.  %
*========.======.========.====.======.==========.=========.=====.=====
        2                        CODE1
        5                        CODE2
        2                        CODE3
                    ..... END REPORT .....
```

Note — You can specify eight sets of parameters and analyses.

Scaling: Arranging Keys into Fixed-Size Intervals

Description — Scaling creates intervals of values within the key field. For example, you can scale the values in a date key field to perform calculations based on weekly intervals. To scale a key field, specify the appropriate scaling (S) option. See Scaling Types described below.

Scaling Notes

- Each scaled key field must be defined by its own scaling option.
- Each interval shown in the result has one output line associated with it.
- By default, the lower value in the interval is displayed.
- By default, only intervals containing values are included.

Scaling Types — You can scale three types of data: numbers, dates, and times. Each scaling type uses a different format for the S option. The screens that follow describe each scaling type and option format.

Numeric Scaling

Description — Use numeric scaling to group values together within the same numeric interval and treat them as a single key.

S Option for Numeric Scaling — `Sn(intv[/min/max])`

Format Fields

S	Option letter.
n	Number of the key field to be scaled.
intv	Size of the interval.
min	Minimum scaled value. Key field values smaller than this value are ignored.
max	Maximum scaled value. Key field values larger than this value are ignored.

Count Example: Scaling a Numeric Key Field

Function Mask

```
s1(.5)
*Location. . . .Down. Cause.  Value    .  Cost    .
*========. . . .====.======.==========.=========.
                    1                     /
r                                         1
```

Scaling Option

s1 Creates intervals based on key field 1.
.5 Defines an interval size of .5.

Parameters Used

1 Labels the Down field as key field 1.
/ Computes average cost for each interval. Note that intervals that contain no entries are omitted.
r Rounds cost field to whole numbers.

Result

```
*Location. . . .Down. Cause.  Value    .  Cost    . . . .
*========. . . .====.======.==========.=========. . . .
                  1.0                        1270
                  2.0                         550
                  4.0                        7500
```

Date Scaling

Description

By scaling date keys, you group dates together within the same interval and treat them as a single key.

S Option for Date Scaling

SnDf(intv[/min/max/strt])

Fields

S Option letter.

n Number of the key field to be scaled.

D Indicator of date scaling.

f Number indicating the date format of the data in the key field. See the related screen "Count Function Date and Time Formats" for date format numbers.

Date Scaling (cont.)

S Option for Date Scaling

SnDf(intv[/min/max/strt])

Fields (cont.)

intv Size of the interval. This field consists of a positive integer number (n) and a letter describing the type of interval. Formats of the field follow:

```
nD   n = number of days (default)
nW   n = number of weeks
nM   n = number of months
nY   n = number of years
```

For example, 2M creates an interval size of two months.

min Minimum scaled date in the same date format as the data in the key field. Earlier dates are ignored.

max Maximum scaled date in the same date format as the data in the key field. Later dates are ignored.

Date Scaling (cont.)

S Option for Date Scaling

SnDf(intv[/min/max/strt])

Fields (cont.)

strt Interval starting date. Must be same date format as the key field, or must be a special value listed here. The strt value depends on the intv value.

If intv is:	Then strt value is:	Example
nD or nW	Three-character day name	SUN
nM	Three-character month name	MAY
nY	Two- or four-digit year	90 or 1990

For example, if you create weekly intervals and choose a starting point of WED, weeks begin on Wednesday and end on Tuesday.

Defaults = January 1, 1944, (for year or month scaling); January 2, 1944, Sunday (for day or week scaling).

Count Example: Scaling a Date Key Field

Function Mask

```
s1D1(2W/890520/891201/SAT)
*Location.Date  .  Time  . . .  Value   .  Cost   . . .
*========.======.========. . .==========.=========. . .
          1                              /
```

S Option

s1	Scales on key field 1.
D1	Indicates date scaling in date format 1 (YYMMDD).
2W	Creates an interval size of 2 weeks.
890520	Ignores dates before 890520.
891201	Ignores dates after 891201.
SAT	Begins each interval on a Saturday.

Parameters Used

1	Labels the Date field as key field 1.
/	Computes average cost for each interval. Note that intervals with no entries are omitted.

Count Example: Scaling a Date Key Field (cont.)

Description

Following is the result of the date scaling example.

Result

```
*Location.Date  .  Time  . . .  Value   .  Cost   . . .
*========.======.========. . .==========.=========. . .
          890603                                  1455
          890701                                    32
          890923                                  7500
          891118                                    20
```

Time Scaling

Description

By scaling time keys, you group times together within the same interval and treat them as a single key.

S Option for Time Scaling

SnTf(intv[/min/max/strt])

Fields

S	Option letter.
n	Number of the key field to be scaled.
T	Indicator of time scaling.
f	Number indicating the time format number of the data in the key field. See the related screen "Count Function Date and Time Formats" for time format numbers.

Time Scaling (cont.)

S Option for Time Scaling

SnTf(intv[/min/max/strt])

Fields (cont.)

intv — Size of the interval. This field consists of a positive integer number (n) and a value describing the type of interval. Formats of the field follow:

- nS = n number of seconds (default)
- nM = n number of minutes
- nH = n number of hours

For example, 2M creates an interval size of two minutes.

min — Minimum scaled time in the same time format as the data in the key field. Times in the key field that are earlier than this time are ignored.

Time Scaling (cont.)

S Option for Time Scaling

SnTf(intv[/min/max/strt])

Fields (cont.)

max — Maximum scaled time in the same time format as the data in the key field. Later times are ignored.

strt — Starting time for intervals. This field must be in the same time format as the data in the key field.

Default = 00:00:00.

Count Example: Scaling a Time Key Field

Function Mask

```
s1T0(6H/06:00:00)
*Location.Date  .  Time  .Down. Cause . . .
*========.======.========.====.====== . . .
                    1        +
```

S Option

s1	Scales on key field 1.
T0	Indicates times are in format 0 (HH:MM:SS).
6H	Creates an interval size of 6 hours.
06:00:00	Ignores times before 06:00:00.

Parameters Used

1	Labels the Time field as key field 1.
+	Computes amount of hours down for each interval. Note that intervals with no entries are omitted.

Count Example: Scaling a Time Key Field (cont.)

Description

Following is the result of the time scaling example.

Result

```
*Location.Date  .  Time  .Down. Cause . . .
*========.======.========.====.====== . . .
                  06:00:00 2.40
                  12:00:00 0.50
                  18:00:00 4.70
```

Count Example: Extending Intervals to the Boundaries

Description

Using scaling with the B option, you can include numeric time and date intervals that contain no occurrences within the boundaries you specified. This option is useful to identify intervals where data may be missing or to identify patterns of occurrences.

Function Mask

```
s1(1/0/5)b
*Location. . . .Down. Cause.  Value    .  Cost    .
*========. . . .====.======.==========.=========.
                  1                      +
```

S Option

s1	Creates intervals in the key field 1.
1	Sets the interval size at 1.
0	Begins the first interval at 0.
5	Begins the last interval at 5.

Count Example: Extending Intervals to the Boundaries (cont.)

Function Mask (cont.)

```
s1(1/0/5)b
*Location. . . .Down. Cause.  Value    .  Cost    .
*========. . . .====.======.==========.=========.
                  1                      +
```

B Option

b	Extends the intervals to the limits as set by the scaling option (0 and 5 in this example). In this case, even though there may be no data in some of the intervals, the b option includes those intervals in the result.

Parameters Used

1	Specifies the Down field as key field 1.
+	Calculates subtotal for each unique key. In other words, finds the cost per interval.

Count Example: Extending Intervals to the Boundaries (cont.)

Result

```
*Location. . . .Down. Cause.  Value    .  Cost    .
*========. . . .====.======.==========.=========.
                    0                        124
                    1                       3810
                    2                        550
                    3                          0
                    4                       7500
                    5                          0
```

Note: If the B option had not been included, the intervals that contained no entries (3 and 5) in the input result would have been omitted from the result.

Count Example: Suppressing Headings in Multiple Analyses

Function Mask

```
h
*Location. . . .Down. Cause.  Value    .  Cost    .Count.
*========. . . .====.======.==========.=========.=====.
 1                                        +
                        1                 /          =
```

H Option

h	Omits the headings that normally appear between multiple analyses.

First Set of Parameters Used

1	Specifies the key field.
+	Subtotals the cost for each location.

Second Set of Parameters Used

1	Specifies the key field.
/	Calculates the average cost for each system.
=	Counts the number of data lines for each system. In other words, counts the number of entries for each unique key.

Count Example: Suppressing Headings in Analyses (cont.)

Result

```
*Location. . . .Down. Cause.  Value      Cost    .Count.
*========. . . .====.======.==========.=========.=====.
BOSTON                                     1004
CHICAGO                                   10970
NEW YORK                                     10
                          CODE1          302.50000     2
                          CODE2          767.80000     5
                          CODE3               3770     2
```

Count Example: Calculating Total Summarizations

Function Mask

```
t
*Location. . . .Down. Cause.  Value    .  Cost    .Count.
*========. . . .====.======.==========.=========.=====.
 1              +%    =                  >
```

T Option

t	Displays a total for each computed field. Subtotaling shows a grand total; averaging shows a grand average; entry counting shows total entries; minimum and maximum operators show the smallest or largest values in the field.

Parameters Used

1	Specifies the key field.
+%	Specifies subtotal percentage.
=	Specifies an entry count.
>	Specifies the maximum value.

Count Example: Calculating Total Summarization (cont.)

Result

```
*Location. . . .Down. Cause.  Value      Cost    .Count.
*========. . . .====.======.==========.=========.=====.
 BOSTON          19.      4                 900
 CHICAGO         73.      4                7500
 NEW YORK         9.      1                  10
*                ---- ------            ---------
*               100.      9                7500
.
. OUTPUT LINES = 3
                          ..... END REPORT .....
```

Interpretation

The Chicago location accounted for 73 percent of the total down time for all locations. There were a total of 9 down-time events. The maximum cost in Boston was $900 and in New York was $10. The maximum cost at any location was in Chicago at $7500. Three locations were included in the report.

Count Example: Displaying Only Specified Result Fields

Description

To include in the result only the fields for which you specified a parameter, use the P option.

Function Mask

```
p
*Location. . . .Down. Cause.  Value    .  Cost    .Count.
*========. . . .====.======.==========.=========.=====.
 1                                        +
```

P Option

p Packs the result so that only requested fields are displayed in the result.

Parameters Used

1 Specifies the key field.
+ Subtotals the cost for each location.

Result

```
*Location.  Cost    .
*========.=========.
 BOSTON        1004
 CHICAGO      10970
 NEW YORK        10
```

Count Example: Reordering Specified Result Fields

Description

In addition to including in the result only the fields for which you specified a parameter, the P option also reorders the fields according to a preset hierarchy: key fields, extraction fields, computational fields, minimum fields, maximum fields, entry counts and percentages.

Function Mask

```
p
*Location. . . .Down. Cause.  Value    .  Cost    .Count.
*========. . . .====.======.==========.=========.=====.
 1              b+   /b     /a          a+
```

P Option

p Packs the result so that only requested fields are displayed in the result.

Parameters Used

1 Specifies the key field.
b+ Labels the Down field as B and subtotals the down time for each key in the key field.

Count Example: Reordering Specified Result Fields (cont.)

Function Mask

```
p
*Location. . . .Down. Cause.  Value    .  Cost    .Count.
*========. . . .====.======.==========.=========.=====.
 1              b+   /b     /a          a+
```

Parameters Used (cont.)

/b Calculates the average value for each unique key in the field labeled B.
/a Calculates the average value for each unique key in the field labeled A.
a+ Labels the Cost field as A and subtotals the cost for each key in the key field.

Result

```
*Location.  Cost    .  Value    .Down. Cause
*========.=========.==========.====.======
 BOSTON        1004         251 2.10 0.5250
```

CHICAGO	10970	2742.50000	8.20	2.0500
NEW YORK	10	10	1	1

Count Function Menu Procedure

Procedure

Select menu items using the menu path below. (Press Format to see an alternative procedure.)

Was a report on display?
Yes: Fill in the function mask.
No: Fill in the function form first, then the function mask.

Menu Path

Select task
  Perform math operations
    Count and analyze data (CNT)

Count Function Control Line Procedure

Procedure

Enter one of the following formats on the control line. (Press Menus to see an alternative procedure.)

Formats

CNT
  Was a report on display?
  Yes: Displays the function mask.
  No: Displays the function form.

CNT rd[c f]
  Displays the function mask.

Fields

rdc Report to process.

f Report format in which to process data.

Count Function Options

A Processes all line types.

B Extends the boundaries for scaling intervals to the minimum and maximum values defined in the scaling option. Every interval between those boundaries is displayed, even intervals with no entries. See the related screen "Count Example: Extending Intervals to the Boundaries" for an example.

C Distinguishes between uppercase and lowercase letters. Default = the system processes and displays the keys as uppercase.

D[n] Processes only those keys that occur n or more times, where n is an integer greater than 1. Default = 2.

E Extracts result fields from the last occurrence of each unique key. Default = first occurrence.

Count Function Options (cont.)

F Extracts result fields from the first occurrence of each unique key. When using a minimum (<) or maximum (>) operator, default = minimum or maximum field.

H Displays only the first set of headings in the result when you process more than one set of parameters in a single function request. See the related screen "Count Example: Suppressing Headings in Multiple Analyses."

I Includes out-of-range keys. Substitutes the minimum or maximum boundary value, when applicable, for an out-of-range key. The key field is then considered valid, and all its values are counted. Default = the line is discarded for values outside the boundaries.

Nn Substitutes invalid numeric data with the value n. Default = 0.

Count Function Options (cont.)

O Omits data lines from the result. Only heading lines, grand total summary, and warning messages are included in the output result. The T and W options are automatically implied when the O option is specified.

P Packs the result by removing all nonreferenced fields from the result and reorders the fields, from left to right, according to this hierarchy:

1. Key fields in numeric order
2. Extraction fields in alphabetical order
3. Computational fields (subtotals, averages, and so on)
4. Minimum fields
5. Maximum fields
6. Entry counts
7. Percentages

See the related screen "Displaying Only Specified Result Fields" for an example.

Count Function Options (cont.)

Rn Rounds number to the nearest n. Use the E option to round entry counts. The range for n is .0000000000000001 to 100000.

For example, r.001 rounds the values to the nearest thousandth. The option r1000 rounds the values to the nearest thousand.

Rx-y Processes a range of reports from x through y.

Rx,y Processes reports x and y. The reports are processed in the order you specify.

Rx-y,z Processes reports x through y and also z. The reports are processed in the order you specify.

Count Function Options (cont.)

Sn Creates intervals or scales in key fields.

```
Sn(intv[/min/max])              Scales numeric values.
SnDf(intv[/min/max/strt])       Scales dates.
SnTf(intv[/min/max/strt])       Scales times.
```

n Number of the key field to scale (1 through 9).

f Date format number.

0 YMMDD	3 YDDD	6 MM/DD/YY
1 YYMMDD	4 YYDDD	7 MONTH DD,YYYY
2 DD MMM YY	5 DDMMYY	8 MMDDYY

Time format number.

0 HH:MM:SS	2 HHMMSS
1 HH:MM	3 HHMM

Count Function Options (cont.)

Sn (cont.) Creates intervals or scales in key fields.

```
Sn(intv[/min/max])              Scales numeric values.
SnDf(intv[/min/max/strt])       Scales dates.
SnTf(intv[/min/max/strt])       Scales times.
```

intv Interval size.

Date intervals:

nD n = number of days (default)
nW n = number of weeks
nM n = number of months
nY n = number of years

Time intervals:

nS n = number of seconds
nM n = number of months
nH n = number of hours

Count Function Options (cont.)

Sn (cont.) Creates intervals or scales in key fields.

```
Sn(intv[/min/max])              Scales numeric values.
SnDf(intv[/min/max/strt])       Scales dates.
SnTf(intv[/min/max/strt])       Scales times.
```

min Minimum value at which to begin scaling.
max Maximum value at which to end scaling.
strt Starting value.

If intv is:	Then strt value is:	Example
nD or nW	Three-character day name	SUN
nM	Three-character month name	MAY
nY	Two- or four-digit year	90 or 1990
nS,nM,nH	Same format as key field	

See the related screen "Scaling: Arranging Keys into Fixed-Size Intervals".

Count Function Options (cont.)

T — Displays total, overall summary values for each computed field at the end of each result. For example, subtotaling shows a grand total; averaging shows a grand average; entry counting shows total entries; minimum and maximum operators show the smallest or largest values in the field. You can also calculate the overall standard deviation of values in a field.

U — Displays the upper limit of the interval for scaled results rather than the lower limit.

V — Does not count lines with invalid numeric, date, or time fields. Default = 0 for numeric operations; January 1, 1944, for date calculations; or 00:00:00 for time operations.

W — Adds messages at the end of the result showing the number of lines skipped due to invalid key or data fields.

Count Function Options (cont.)

Z — Displays all intervals in the result, even those with no entries. This option allows you to create a scale with no gaps. Use this option only with the S option.

* — Flags invalid subtotals, averages, standard deviations, maximums, and minimums if invalid data were used in the calculations.

Count Function Parameters (cont.)

1-9 — Key fields (at least 1 is required)

N — Numeric key fields (1N)

Df — Date key fields (See the Sn option for formats.)
f = 0-8 to specify date format
Example: 1D0, specifies key field 1 in date format 0

Tf — Time key fields (See the Sn option for formats.)
f = 0-3 to specify time format
Example: 2T3, specifies key field 2 in time format 3

R — Report key fields
Example: 1R, loads the field with the report number when processing a drawer or range of reports

L — Line key fields
Example: 1L, loads the field with the input report line number

Details — For detailed explanations of Count parameters press Relatd to select "Key Field Parameters" or "Extraction Parameters."

Count Constant-Label Key Field Parameters (cont.)

Definition — Constant-label key field parameters load fields with data extracted from a range of reports at execution time. Use these parameters to extract and display information about key fields that appear in multiple reports.

Report Number (R)	Places the input report number into the field.
Line Number (L)	Loads the field with the input report line number.
Multiple Analysis Number (M)	Loads the field with the corresponding analysis number. If you use more than one set of parameters (perform more than one analysis) in a statement, the statement creates a single result containing output from all of the analyses. This operator (M) loads the specified field with the number of the analysis that is the source of the output line. For example, output lines created by the first set of parameters are loaded with a value of one.

Count Function Operators (cont.)

Operators

Entry count (=)	Minimum (<)
Percentage (%)	Maximum (>)
Subtotal (+)	Standard Deviation
Subtotal Percent (+%)	Sample (!-); Population (!+)
Average (/)	Variance
Delete field (-)	Sample (!!-); Population (!!+)

Cumulative total by key field (++)
Cumulative count by key field (=+)
Cumulative percentage of occurences by key field (%+)
Cumulative percentage of total value by key field (+%+)

Constant Label Operators	Report Number	:R
	Line Number	:L
	Multiple Analysis Number	:M

Details and Examples: For detailed explanations of Count parameters and examples, press Relatd.

CNT Run Statement

Description

Use the CNT run statement to analyze and summarize data. Based on key fields, the statement computes subtotals, percentages, standard deviations, averages, entry counts, and much more.

Format

```
@CNT,c,d[,r] o cc ltyp,p [vrslts] .
```

When to Use the CNT Statement

Use the CNT statement to do the following:

- Reduce processing time by using one CNT statement to replace sequences of other run statements that perform a variety of analyses.
- Subtotal fields without having to sort them first.
- Perform calculations on a single report or across an entire drawer.

Outcome

The statement creates a -0 result containing the

calculations performed. If you specify more than one set of parameters, the -0 result contains a result for each set of parameters separated by heading lines and a .EJECT command.

Variables Loaded — Up to eight variables may be returned by the CNT run statement. Each variable contains the number of data lines for the corresponding output result. See the related screen "Multiple Analyses in a Single Pass."

More Outcome Information — See the related screen "Count Function Outcome" for more information.

CNT Run Statement Reserved Words

'STAT2$' Contains the number of lines ignored in all results for invalid o out-of-range key conditions.

'STAT3$' Contains the number of lines ignored in all results for invalid numeric, date, or time values. The value is meaningful only if you specified the V option.

CNT Run Statement Example: Finding an Average and Rounding

Example — This statement finds the average of the Down field for each unique value in the Location field:

```
@cnt,0,a,42 '' 'location','down' |,1,'/' .
```

'0',a,42 — Process report 42A0.

'' — Use no options.

'location' 'down' — Identify the fields to process.

| — Process tab lines only.

'1', — Identify the Location field as the key field.

'/' — Identify the Down field as the field to find the average for.

Reminder

For More Information — You can display a description of each field in the run statement format by pressing Format. To display information about options and parameters, press Op&Prm.

CNT Run Statement Format

Format @CNT,c,d[,r] o cc ltyp,p [vrslts] .

Fields

CNT Run function call.

c,d,r Report or drawer to process.

o Options. Press Op&Prm for the available options.

cc Column-character positions or names of the fields to process.

ltyp Line type to process.

p Parameters. Press Op&Prm for the available parameters.

vrslts Variable to capture the number of lines for the corresponding output result. Up to eight variables may be returned by the statement.

..... END REPORT .....