

Euredit EM function: em

1 Purpose

em estimates missing values using the multivariate normal expectation maximisation (EM) algorithm.

2 Specification

```
#include <euredit_sys.h>
```

```
void em (long n, long m, long *sx, double *data, double miss_val, double tol,
         long max_cycle, double *swts, long *nrepl, long *missing_row,
         long *missing_column, double *repl_val, long info[2])
```

3 Parameters

n

Input: the number of observations in the data.

Constraint: $n \geq 1$.

m

Input: the number of variables in the data.

Constraint: $m \geq 1$.

sx[m]

Input: if $sx[i] > 0$ the i th variable is included in the analysis otherwise it is excluded from the analysis.

data[n*m]

Input: the data stored by row.

miss_val

Input: the missing value indicator.

tol

Input: the convergence tolerance.

Constraint: $tol \geq 10^{-16}$.

max_cycle

Input: the maximum number of cycles for the EM algorithm

Constraint: $max_cycle \geq 1$.

swts[n]

Input: **swts**[i] contains the weight on the i th observation. If **swts** is NULL, all weights are taken to be 1.

nrepl

Output: the number of values replaced.

missing_row[nrepl]

Output: the row indicator for a replacement value.

missing_column[nrepl]

Output: the column indicator for a replacement value.

rep_val[nrepl]

Output: the replacement value.

info

Output: information on the success of the function call.

info[0] = 0: the function successfully completed its task.

info[0] = i : the specification of the i th formal parameter was incorrect, $i = 1, 2, \dots, 13$.

info[0] = 20: no missing values.

info[0] = 30: covariance matrix not positive definite.

info[0] = 40: algorithm has not converged.

info[0] = 99: the function failed to allocate enough memory.

info[1] contains additional information for system debugging.