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1 Documentation for the procedures in 3d_mat.src

The procedures in this file handles three-dimensional matrices. The following procedures are available:

make_3d : proc
put_3d : proc
get_3d : proc
del_3d : proc

The procedures are described below.

1.1 make_3d

This procedure creates a three-dimensional matrix with the dimensions x, y and z. x denotes the number of rows in the two-dimensional matrix. y denotes the number of columns in the two-dimensional matrix. z denotes the number of two-dimensional matrices that are stacked on top of each other. The first sheet with a two-dimensional matrix is given the value z=1.

x	number of rows
y	number of columns
z	number of sheets

Table 1: Size of the three-dimensional matrix.

Syntax: {mat_3d}=make_3d(x,y,z);

Inputs: x, y, z (see Table 1).

Output: A two-dimensional matrix, *mat_3d*, that is the object used to replicate a three-dimensional matrix.

1.2 put_3d

This procedure takes a two-dimensional matrix of size $x \times y$ and puts it in a specified column of the three-dimensional matrix.

Syntax: {mat_3d}=put_3d(put_mat,mat_3d,i);

Inputs: *put_mat* is the matrix to be put into the *i:th* sheet of the three-dimensional matrix *mat_3d*.

Output: *mat_3d* is the three-dimensional matrix that was fed to the procedure but it is returned with the matrix *put_mat* in the i:th sheet.

1.3 get_3d

This procedure gets the $x \times y$ matrix in the i:th sheet from the three-dimensional matrix *mat_3d*.

Syntax: {get_mat}=get_3d(mat_3d,x,y,i);

Inputs: The three-dimensional matrix that the two dimensional matrix is to be extracted from is denoted *mat_3d*. x and y are the number of rows and columns of the matrix that is to be extracted. i denotes the sheet in which the extracted matrix is to be found.

Output: *get_mat* is the matrix that is extracted.

1.4 del_3d

This procedure places zeros in a sheet of the three-dimensional matrix.

Syntax: {mat_3d}=del_3d(mat_3d,x,y,i);

Inputs: Places a two-dimensional matrix with x rows and y columns of zeros in the *i:th* sheet of *mat_3d*.

Output: *mat_3d* is the new matrix with the *i:th* sheet set to zero.

2 Sample Gauss program

```
x=3;                          /* Sets the number of rows in the 2d matrix
    y=2;                          /* Sets the number of cols in the 2d
matrix
    z=5;                          /* Sets the number of sheets in the 3d
matrix
    {c3d}=make_3d(x,y,z);         /* Generates a 3d matrix
    mat=1~2|3~4|5~6;              /* Defines a 2d submatrix
    {c3d}=put_3d(mat,c3d,1);      /* Places the 2d matrix in the first sheet
of the 3d matrix
    mat2=get_3d(c,x,y,1);         /* Gets the 2d matrix
    {c3d}=del_3d(c3d,x,y,1);      /* Deletes the 2d matrix in the first sheet
of the 3d matrix
```