1
```
art;maple_mode(0);cas_setup(0,0,0,1,0,1e-10,10,[1,50,0,25],0,0,0);//radians,pas de cmplx, pas de  Sqrt
```

[[], Warning: some commands like subs might change arguments order , 0, 0, 0, 1, 0, 0.9999999999

2
```
----------------------------------------------------------------------------------------------
```

3
```
A := [[0,-2,1,3],[0,0,0,1],[1,1,0,0],[-3,4,1,0]];
```

$$\begin{bmatrix} 0, & -2, & 1, & 3 \\ 0, & 0, & 0, & 1 \\ 1, & 1, & 0, & 0 \\ -3, & 4, & 1, & 0 \end{bmatrix}$$

4
```
B:=matrix(4,4):;B[0,1]:=1:;B[1,0]:=1:;B[2,2]:=1:;B[3,3]:=1:;B;
```

$$\left(\text{Done}, \ \text{Done}, \ \text{Done}, \ \text{Done}, \ \text{Done}, \ \begin{bmatrix} 0, & 1, & 0, & 0 \\ 1, & 0, & 0, & 0 \\ 0, & 0, & 1, & 0 \\ 0, & 0, & 0, & 1 \end{bmatrix} \right)$$

5
```
B*A;
```

$$\begin{bmatrix} 0, & 0, & 0, & 1 \\ 0, & -2, & 1, & 3 \\ 1, & 1, & 0, & 0 \\ -3, & 4, & 1, & 0 \end{bmatrix}$$

6
```
T:=proc(i0,i1,a)
local TT;
TT:=identity(4):;TT[i0-1,i1-1]:=a:;TT;
end proc;
```

```
// Success
// End defining T
```

```
(i0,i1,a)->
{ local TT;
  TT:=identity(4);
  TT[i0-1,i1-1]:=a;
  TT;
}
```

7

undef

8
```
T(3,1,1/2)*B*A;
```

$$\begin{bmatrix} 0, & 0, & 0, & 1 \\ 0, & -2, & 1, & 3 \\ 1, & 1, & 0, & \frac{1}{2} \\ -3, & 4, & 1, & 0 \end{bmatrix}$$

9
```
T(4,1,3/2)*T(3,1,1/2)*B*A;
```

$$\begin{bmatrix} 0, & 0, & 0, & 1 \\ 0, & -2, & 1, & 3 \\ 1, & 1, & 0, & \frac{1}{2} \\ -3, & 4, & 1, & \frac{3}{2} \end{bmatrix}$$

10 F:=matrix(4,4):;F[0,0]:=1:;F[2,2]:=1:;F[1,3]:=1:;F[3,1]:=1:;F;

$$\left(\text{Done}, \text{Done}, \text{Done}, \text{Done}, \text{Done}, \begin{bmatrix} 1, & 0, & 0, & 0 \\ 0, & 0, & 0, & 1 \\ 0, & 0, & 1, & 0 \\ 0, & 1, & 0, & 0 \end{bmatrix}\right)$$

M

11 F*T(4,1,3/2)*T(3,1,1/2)*B*A;//On compose les transpositions

$$\begin{bmatrix} 0, & 0, & 0, & 1 \\ -3, & 4, & 1, & \frac{3}{2} \\ 1, & 1, & 0, & \frac{1}{2} \\ 0, & -2, & 1, & 3 \end{bmatrix}$$

M

12 LU(A,L,U,P);inv(P)*L*U-A;

$$\left(\begin{bmatrix} 0, & 0, & 1, & 0 \\ 1, & 0, & 0, & 0 \\ 0, & 0, & 0, & 1 \\ 0, & 1, & 0, & 0 \end{bmatrix}, \begin{bmatrix} 0, & 0, & 0, & 0 \\ 0, & 0, & 0, & 0 \\ 0, & 0, & 0, & 0 \\ 0, & 0, & 0, & 0 \end{bmatrix}\right)$$

M

13 il faut deplacer les transpositions: On a S.T(i,j,s)=T(i',j',s).S pour i=\sigma(i'),j=\sigma(j')

14 U:=T(4,3,-2)*F*T(4,1,3/2)*T(3,1,1/2)*B*A;

$$\begin{bmatrix} 0, & 0, & 0, & 1 \\ -3, & 4, & 1, & \frac{3}{2} \\ 1, & 1, & 0, & \frac{1}{2} \\ -2, & -4, & 1, & 2 \end{bmatrix}$$

M

15 L:=(F*T(3,1,-1/2)*F^(-1))*(F*T(4,1,-3/2)*F^(-1))*T(4,3,2);

$$\begin{bmatrix} 1, & 0, & 0, & 0 \\ \frac{-3}{2}, & 1, & 0, & 0 \\ \frac{-1}{2}, & 0, & 1, & 0 \\ 0, & 0, & 2, & 1 \end{bmatrix}$$

M

16 S:=B*F^(-1);

$$\begin{bmatrix} 0, & 0, & 0, & 1 \\ 1, & 0, & 0, & 0 \\ 0, & 0, & 1, & 0 \\ 0, & 1, & 0, & 0 \end{bmatrix}$$

17 S*L*U-A;

$$\begin{bmatrix} 0, & 0, & 0, & 0 \\ 0, & 0, & 0, & 0 \\ 0, & 0, & 0, & 0 \\ 0, & 0, & 0, & 0 \end{bmatrix}$$

M

18 purge(a,b,c);

(No such variable a , No such variable b , No such variable c)

M

19 n:=6;L:=matrix(n,n,(i0,j0)->if j0==i0-1 then a[j0] else 0 fi)+idn(n);

// Warning: a, declared as global variable(s)

$$\left(6, \begin{bmatrix} 1, & 0, & 0, & 0, & 0, & 0 \\ a[0], & 1, & 0, & 0, & 0, & 0 \\ 0, & a[1], & 1, & 0, & 0, & 0 \\ 0, & 0, & a[2], & 1, & 0, & 0 \\ 0, & 0, & 0, & a[3], & 1, & 0 \\ 0, & 0, & 0, & 0, & a[4], & 1 \end{bmatrix}\right)$$

M

20 U:=matrix(n,n,(i0,j0)->if i0==j0-1 then b[j0] else 0 fi)+diag(seq(c[i0],i0=0..n-1));

// Warning: b, declared as global variable(s)

$$\begin{bmatrix} c[0], & b[1], & 0, & 0, & 0, & 0 \\ 0, & c[1], & b[2], & 0, & 0, & 0 \\ 0, & 0, & c[2], & b[3], & 0, & 0 \\ 0, & 0, & 0, & c[3], & b[4], & 0 \\ 0, & 0, & 0, & 0, & c[4], & b[5] \\ 0, & 0, & 0, & 0, & 0, & c[5] \end{bmatrix}$$

M

21 normal(L*U)

$$\begin{bmatrix} c[0], & b[1], & 0, & 0, & 0, & 0 \\ (a[0])\cdot(c[0]), & (a[0])\cdot(b[1])+c[1], & b[2], & 0, & 0, & 0 \\ 0, & (a[1])\cdot(c[1]), & (a[1])\cdot(b[2])+c[2], & b[3], & 0, & 0 \\ 0, & 0, & (a[2])\cdot(c[2]), & (a[2])\cdot(b[3])+c[3], & b[4], & 0 \\ 0, & 0, & 0, & (a[3])\cdot(c[3]), & (a[3])\cdot(b[4])+c[4], & b[5] \\ 0, & 0, & 0, & 0, & (a[4])\cdot(c[4]), & (a[4])\cdot \end{bmatrix}$$

M

22