
Un corrigé de TP en MAPLE sur le chapitre 2

Algorithme de Jacobi (en MAPLE)

```
> tan(%?)
> Jacob:=proc(A,b,x0,kmax)
> local n,D,F,j,B,c,x,k;
> n:=RowDimension(A);
> D:=Matrix(n,n);#construit une matrice carree de taille n remplie de 0
> F:=evalm(A);
> for j from 1 to n do
>     F[j,j]:=0;
>     D[j,j]:=A[j,j];
> end do;
> print(F);
> print(D);
> B:=-evalm(MatrixInverse(D)&*F);
> c:=evalm(MatrixInverse(D)&*b);
> print(B);
> print(c);
> x:=x0;
> for k from 1 to kmax do
>     x:=evalf(evalm(B&*x+c));
>
>     print(x);
> end do;
> evalm(x);
> end proc:
> with(LinearAlgebra):
> A:=Matrix([[2,-1,0],[-1,2,-1],[0,-1,2]]);
           [ 2  -1  0]
           [      ]
A := [-1  2  -1]
           [      ]
           [ 0  -1  2]

> x0:=Matrix(3,1):
> b:=Matrix(3,1):b[1,1]:=1:b[3,1]:=2:
> Jacob(A,b,x0,3);
           [ 0  -1  0]
           [      ]
           [-1  0  -1]
           [      ]
           [ 0  -1  0]
           [ 2  0  0]
           [      ]
           [ 0  2  0]
```

```

[      ]
[0  0  2]
[  -1   ]
[ 0  --  0]
[  2     ]
[      ]
[-1     -1]
-[--  0  --]
[2      2 ]
[      ]
[  -1   ]
[ 0  --  0]
[  2     ]
[1]
[-]
[2]
[ ]
[0]
[ ]
[1]
[0.5000000000]
[      ]
[      0.]
[      ]
[      1.]
[0.5000000000]
[      ]
[0.7500000000]
[      ]
[      1.]
[0.8750000000]
[      ]
[0.7500000000]
[      ]
[ 1.375000000]
[0.8750000000]
[      ]
[0.7500000000]
[      ]
[ 1.375000000]

```