$a_{ii} = (Ae_i, e_i)$

$a_{ij} = (Ae_j, e_i)$

```
   |x|  k components nonzero
u= |0|  followed by zeros.
```

$(Au,u) = (A_k\, x, x)$

===

$(X^T A X v, v) > 0$? for all nonzero v?

$(X^T A X v, v) = (A X v, Xv) \equiv (Au,u)$ with $u = Xv$

if v is nonzero then u is nonzero then $(Au,u)>0$ done

because X is of full rank.

===

at kth step :

$$\det(A_k) = \prod_{i=1}^{k} u(i,i) \qquad u(k,k) = \det(A_k)/\det(A_{k-1})$$

==> $u(1,1)>0$ $u(2,2)>0$ .... $u(i,i)>$

$A = L D L^T$

==

$(A(x+y),x+y) = (Ax,x) + (Ay,y) + 2\,(Ax,y)$

——————>0 —> 0 —>0

$(Ax,y) = 0\ \forall x\ \forall y$

use $x = e_j$ $y = e_i$ ==> $a_{ij} = 0$ done.

==

LU:

$$a(i,j) \leftarrow a(i,j) - \frac{a(i,k)\, a(k,j)}{a(k,k)}$$