

# Matrix Algebra question

---

*Source:* <http://sci.tech-archive.net/Archive/sci.math/2008-06/msg01278.html>

---

- *From:* TCL <[tlim1@xxxxxxx](mailto:tlim1@xxxxxxx)>
  - *Date:* Fri, 13 Jun 2008 20:02:57 -0700 (PDT)
- 

Let  $L_2$  be the  $2 \times 2$  lower triangular matrix whose nonzero off diagonal entry is 2, i.e.  $a_{11}=1$ ,  $a_{12}=0$ ,  $a_{21}=2$ ,  $a_{22}=1$ . Let  $U_2$  be its transpose.

I am looking for an easy proof of the following fact:

The group (with matrix multiplication) generated by  $\{L_2, U_2\}$  is the set of matrices  $A$  with  $a_{11}$ ,  $a_{22}$  odd, and  $a_{21}$ ,  $a_{12}$  even, and  $\det(A)=1$ .

A direct proof seems to be not easy.

-TCL

.