1023-16-334   **Bogdan Petrenko*** (`petrenko@math.tamu.edu`), Department of Mathematics, Texas A&M University, College Station, TX 77843-3368, and **Said Sidki** (`sidki@mat.unb.br`), Department of Mathematics, University of Brasilia, 70.910 Brasilia DF, Brazil. *On pairs of matrices generating matrix rings and their presentations.*

Let $M_n(\mathbb{Z})$ be the ring of n-by-n matrices with integral entries, and $n \geq 2$. This paper studies the set $G_n(\mathbb{Z})$ of pairs $(A, B) \in M_n(\mathbb{Z})^2$ generating $M_n(\mathbb{Z})$ as a ring. We use several presentations of $M_n(\mathbb{Z})$ with generators $X = \sum_{i=1}^{n} E_{i+1,i}$ and $Y = E_{11}$ to obtain the following consequences.

1. Let $k \geq 1$. The following rings have presentations with 2 generators and finitely many relations:

    (a) $\bigoplus_{j=1}^{k} M_{m_j}(\mathbb{Q})$ for any $m_1, \ldots, m_k \geq 2$.

    (b) $\bigoplus_{j=1}^{k} M_{n_j}(\mathbb{Z})$, where $n_1, \ldots, n_k \geq 2$, and the same n_i is repeated no more than three times.

2. Let D be a commutative domain of sufficiently large characteristic over which every finitely generated projective module is free. We use 4 relations for X and Y to describe all representations of the ring $M_n(D)$ into $M_m(D)$ for $m \geq n$.

3. We obtain information about the asymptotic density of $G_n(F)$ in $M_n(F)^2$ over different fields, and over the integers.

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