

In general, $Mn(I)$ is a left ideal in $Mn(R)$. However, it need not be a *minimal* left ideal. To construct an example, let $R = M_2(k)$, where k is a field. Take I to be the minimal left ideal $\begin{pmatrix} k & 0 \\ k & 0 \end{pmatrix}$ in R . Then $\dim_k Mn(I) = n^2 \dim_k I = 2n^2$.

However, for $S = Mn(R) \sim M_{2n}(k)$, the unique simple left S -module M has k -dimension $2n$, so $Mn(I) \sim n \cdot M$ as left S -modules. In particular, if $n > 1$, $Mn(I)$ is *not* a minimal left ideal in $S = Mn(R)$. Even more simply, k is a minimal left ideal of k , but $Mn(k)$ is not a minimal left ideal of $Mn(k)$.