

How is this for a hint?

$$\begin{pmatrix} A & 0 & 0 \\ 0 & A & 0 \\ 0 & 0 & A \end{pmatrix} \begin{pmatrix} I_1 \\ I_2 \\ I_3 \end{pmatrix} = \begin{pmatrix} AI_1 \\ AI_2 \\ AI_3 \end{pmatrix}$$

But is there an easy way to create that block diagonal matrix?

```
>> A=[1,2;2,4]
```

A =

```
    1    2
    2    4
```

```
>> help blkdiag
```

BLKDIAG Constructs a block diagonal matrix based on the input.

Y = BLKDIAG(A,B,C,...) constructs a block diagonal matrix, such that

$$Y = \begin{pmatrix} | & A & 0 & 0 & \dots & 0 & | \\ | & 0 & B & 0 & \dots & 0 & | \\ | & 0 & 0 & C & \dots & 0 & | \\ | & \dots & & & & & | \end{pmatrix}$$

The input parameters are limited to no more than 26.

```
>> B=blkdiag(A,A,A)
```

B =

```
    1    2    0    0    0    0
    2    4    0    0    0    0
    0    0    1    2    0    0
    0    0    2    4    0    0
    0    0    0    0    1    2
    0    0    0    0    2    4
```