Week1 Discussion

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2023-01-29

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Chapter M Exercise C11 page 172

The Problem

Solve the given vector equation for x, or explain why no solution exists.

```
knitr::include_graphics("ProblemC11.png")
```

$$2\begin{pmatrix} 1 & 2 & 3 \\ 0 & 4 & 2 \end{pmatrix} - 3\begin{pmatrix} 1 & 1 & 2 \\ 0 & 1 & x \end{pmatrix} = \begin{pmatrix} -1 & 1 & 0 \\ 0 & 5 & -2 \end{pmatrix}$$

Where the first matrix is `matrix1`, the answer in this problem is `matrix2` and the second matrix is what we are going to solve for and is named `answer`.

```
matrix1 <- matrix(c(1,0,2,4,3,2), nrow = 2)
print(matrix1)
```

```
##      [,1] [,2] [,3]
## [1,]    1    2    3
## [2,]    0    4    2
```

```
matrix2 <- matrix(c(-1,0,1,5,0,-2), nrow = 2)
print(matrix2)
```

```
##      [,1] [,2] [,3]
## [1,]   -1    1    0
## [2,]    0    5   -2
```

```
answer<- (2*matrix1 - matrix2)/3
answer
```

```
##      [,1] [,2] [,3]
## [1,]    1    1    2
## [2,]    0    1    2
```

Checking the math

```
2*matrix1 -3*answer
```

```
##      [,1] [,2] [,3]
## [1,]   -1    1    0
## [2,]    0    5   -2
```

The `answer` matrix where `x=2` when substituted into the initial equation gave the same resulting matrix.