week 10 discussion

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A better way to apply a matrix transformation.

I cannot find a good and simple way to apply a matrix transformation to the markov problem in the homework set. Below is the set up for this problem.

Looking at this situation as a Markov Chain, we have the following matrix containing all states 0,1,2,4,8

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ 0.6 & 0 & 0.4 & 0 & 0 \\ 0.6 & 0 & 0 & 0.4 & 0 \\ 0.6 & 0 & 0 & 0 & 0.4 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

We have an initial state of $\pi_0 = \begin{bmatrix} 0 & 1 & 0 & 0 & 0 \end{bmatrix}$, since he has 1 dollar and can lose it or gain the above states.

Now we need to run the Markov transformation four times to compute the final state probability.

```
markov<- matrix(c(1,0,0,0,0,0.6,0,0.4,0,0,0.6,0,0,0.4,0,0.6,0,0,0,0.4,0,0,0,0,1), byrow=T,nrow=5)
p_state<-matrix(c(0,1,0,0,0),byrow=T, nrow=1)
p_state%*%markov%*%markov%*%markov%*%markov
```

```
##       [,1] [,2] [,3] [,4]  [,5]
## [1,] 0.936    0    0    0 0.064
```

Here I simply repeated the same command four times, but this isn't a robust solution. Is there, to anyone's kowledge a simple way to apply this transformation repeatedly. I could make a loop, but is there a simple built-in function that can be used to do this?