Matrizes no LaTeX

Gabriel Medina, Lethicia Costa, Jessica Barreto

December 2022

1 Deduzir a Fórmula do Determinante 4x4

Determinante =
$(a_{11} \cdot a_{22} \cdot a_{33} \cdot a_{44})$-$(a_{11} \cdot a_{22} \cdot a_{34} \cdot a_{43})$-$(a_{11} \cdot a_{23} \cdot a_{32} \cdot a_{44})$+$(a_{11} \cdot a_{23} \cdot a_{34} \cdot a_{42})$+
$(a_{11} \cdot a_{24} \cdot a_{32} \cdot a_{43})$-$(a_{11} \cdot a_{24} \cdot a_{33} \cdot a_{42})$-$(a_{12} \cdot a_{21} \cdot a_{33} \cdot a_{44})$+$(a_{12} \cdot a_{21} \cdot a_{34} \cdot a_{43})$+
$(a_{12} \cdot a_{23} \cdot a_{31} \cdot a_{44})$-$(a_{12} \cdot a_{23} \cdot a_{34} \cdot a_{41})$-$(a_{12} \cdot a_{24} \cdot a_{31} \cdot a_{43})$+$(a_{12} \cdot a_{24} \cdot a_{33} \cdot a_{41})$+
$(a_{13} \cdot a_{21} \cdot a_{32} \cdot a_{44})$-$(a_{13} \cdot a_{21} \cdot a_{34} \cdot a_{42})$-$(a_{13} \cdot a_{22} \cdot a_{31} \cdot a_{44})$+$(a_{13} \cdot a_{22} \cdot a_{34} \cdot a_{41})$+
$(a_{13} \cdot a_{24} \cdot a_{31} \cdot a_{42})$-$(a_{13} \cdot a_{24} \cdot a_{32} \cdot a_{41})$-$(a_{14} \cdot a_{21} \cdot a_{32} \cdot a_{43})$+$(a_{14} \cdot a_{21} \cdot a_{33} \cdot a_{42})$+
$(a_{14} \cdot a_{22} \cdot a_{31} \cdot a_{43})$-$(a_{14} \cdot a_{22} \cdot a_{33} \cdot a_{41})$-$(a_{14} \cdot a_{23} \cdot a_{31} \cdot a_{42})$+$(a_{14} \cdot a_{23} \cdot a_{32} \cdot a_{41})$

2 Calcular para uma Matriz

$$\begin{vmatrix} 1 & 0 & 2 & 3 \\ 0 & 2 & 1 & 1 \\ 0 & 1 & 3 & 2 \\ 0 & 2 & 2 & 1 \end{vmatrix}$$

$$\begin{vmatrix} 1 & 0 & 2 & 3 \\ 0 & 2 & 1 & 1 \\ 0 & 1 & 3 & 2 \\ 0 & 2 & 2 & 1 \end{vmatrix} \rightarrow 1 \cdot c_{11} + 0 \cdot c_{21} + 0 \cdot c_{31} + 0 \cdot c_{41}$$

$$\begin{vmatrix} 1 & 0 & 2 & 3 \\ 0 & 2 & 1 & 1 \\ 0 & 1 & 3 & 2 \\ 0 & 2 & 2 & 1 \end{vmatrix} \rightarrow c_{11} = (-1)^{1+1} \cdot \begin{vmatrix} 2 & 1 & 1 \\ 1 & 3 & 2 \\ 2 & 2 & 1 \end{vmatrix}$$

$$\begin{vmatrix} 2 & 1 & 1 & 2 & 1 \\ 1 & 3 & 2 & 1 & 3 \\ 2 & 2 & 1 & 2 & 2 \end{vmatrix} \rightarrow 12\text{-}15 = -3$$

3 Comparar com o Numpy

Código

```python
import numpy as np

print("\nSua matriz 4x4 ficou assim: ")
matrix = np.array([[1, 0, 2, 3],
                   [0, 2, 1, 1],
                   [0, 1, 3, 2],
                   [0, 2, 2, 1]])
print(matrix)
print(f"\nO Determinante da sua matriz 4x4 é: {(np.linalg.det(matrix)): 2.2f}")
```

Console

```
In [9]: runfile('C:/Users/gabri/Downloads/untitled0.py', wdir='C:/Users/gabri/Do

Sua matriz 4x4 ficou assim:
[[1 0 2 3]
 [0 2 1 1]
 [0 1 3 2]
 [0 2 2 1]]

O Determinante da sua matriz 4x4 é: -3.00
```