



Why do we need linear algebra?







*very simple example*









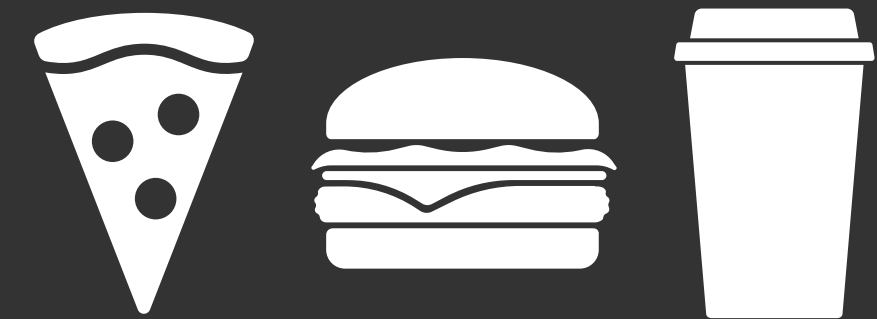
# why do we need linear algebra?

- **Coordinates and Geometry:**  
Linear algebra provides a way to represent and understand geometric concepts like lines, planes, and transformations in higher dimensions.
- **Equations Systems:**  
It offers tools to solve systems of linear equations, which appear in countless areas of study.

## *very simple example*

Imagine you go to a restaurant and order some food. Here's what happens:

1. Your friend orders 3 pizzas and 4 burgers, and the total cost is 38€.
2. Another friend orders 2 combo meals and 1 pizza, and the total cost is 34€.
3. You order 1 combo meal and 2 sodas, and the total cost is 14€.



How much does one pizza cost? How much does one burger cost? How much does one soda cost?

This is a system of two linear equations with two unknowns  $x$  and  $y$ :

$$3x + 4y = 38$$

$$2(x + 2y + z) + x = 34$$

$$x + 2y + 3z = 14$$

