

# 101pong-bootstrap

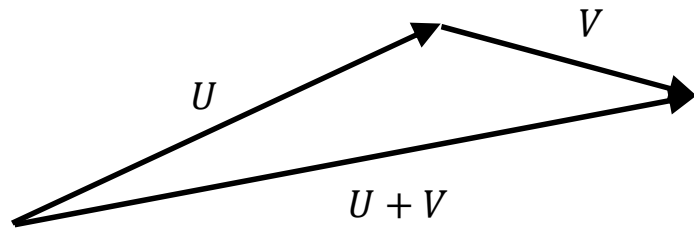
B-MAT-100

# Exercise 1

- Create a function that takes 3 coordinates  $x$ ,  $y$  and  $z$  and returns the corresponding vector
  - Think about how you want to represent a vector!

## Exercise 2

- Create a function that takes 2 vectors and returns the sum
- Create a function that takes 2 vectors and returns the difference



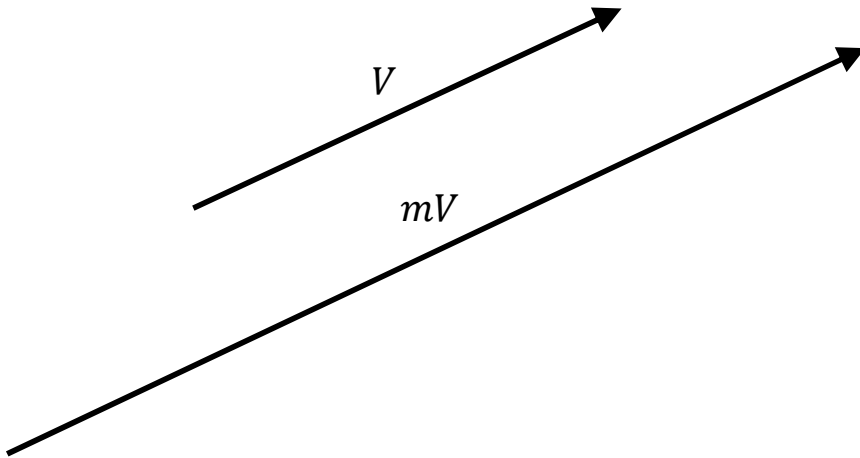
$$U = (x_U, y_U, z_U)$$

$$V = (x_V, y_V, z_V)$$

$$U + V = (x_U + x_V, y_U + y_V, z_U + z_V)$$

## Exercise 3

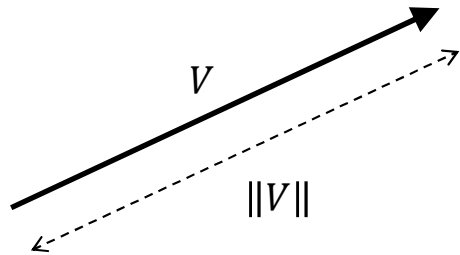
- Create a function that takes a vector  $V$  and a coefficient  $m$  and returns  $mV$



$$V = (x, y, z)$$
$$mV = (mx, my, mz)$$

## Exercise 4

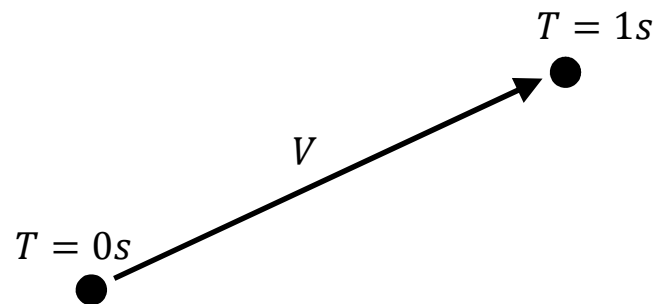
- Create a function that takes a vector and returns its norm



$$V = (x, y, z)$$
$$\|V\| = \sqrt{x^2 + y^2 + z^2}$$

## Exercise 5

- Create a function that takes the 7 arguments of the project and returns the position of the ball at  $t + n$ .

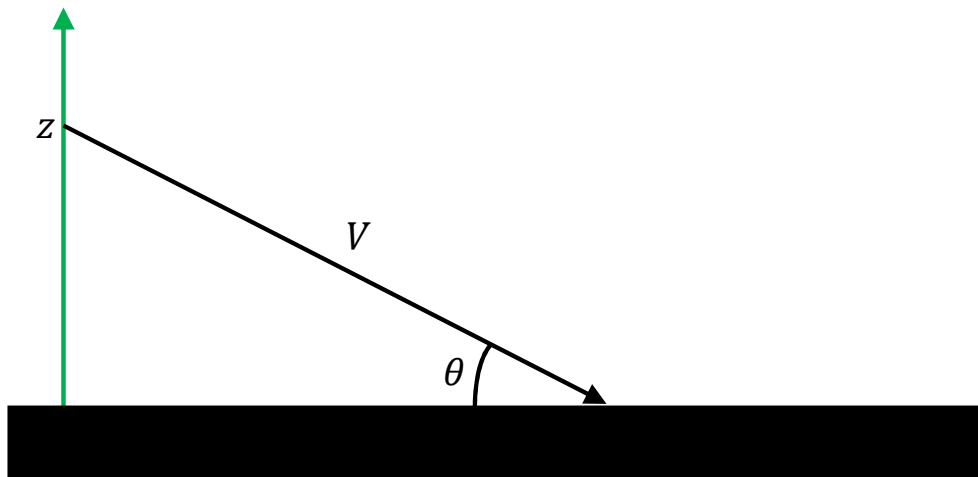


## Exercise 6

- Create a function that takes the 7 arguments of the project and checks if the ball is going to hit the bat.

## Exercise 7

- Create a function that takes a vector and returns the angle between the vector and the plane ( $Oxy$ )



$$\theta = \arcsin\left(\frac{z}{\|V\|}\right)$$