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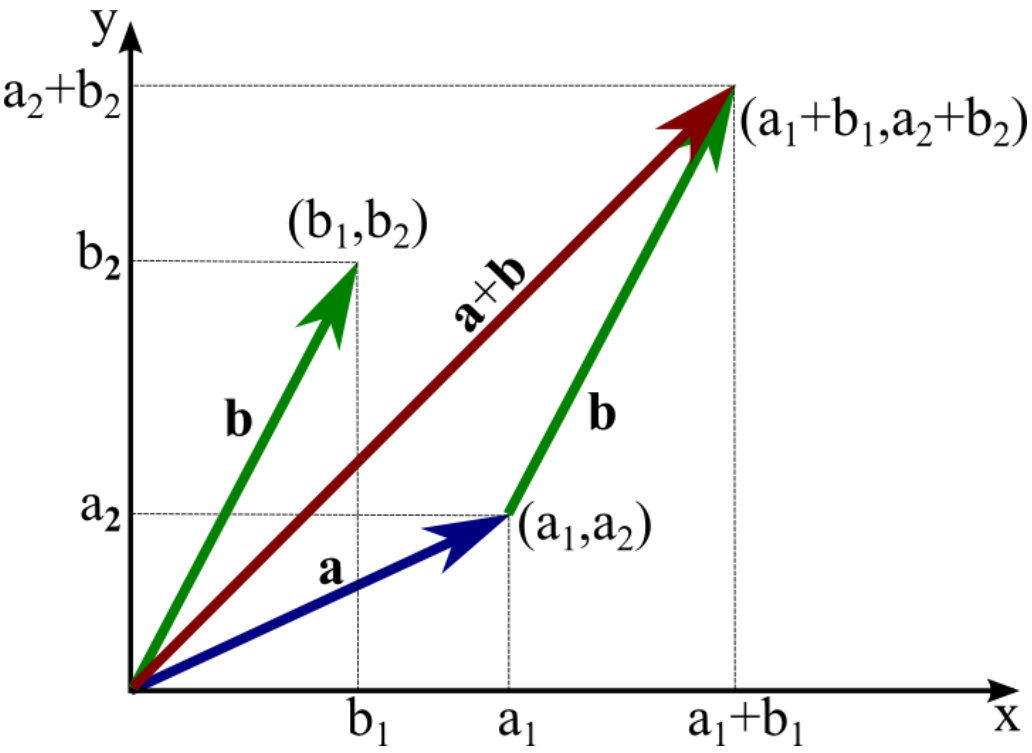
01-04

Challenge 04 - Vector 2D



Objectives

Special methods

Guidelines

2d-vectors are described by a pair of real numbers ${(a,b)}$. There are mathematical rules for operations on vectors:

${(a,b)+(c,d) = (a+c, b+d)}$

${(a,b)−(c,d) = (a−c, b−d)}$

${{(a,b)}.{(c,d)} = ac + bd}$

${||(a,b)||= \sqrt{{(a,b)}.{(a,b)}}}$

Moreover, two vectors ${(a,b)}$ and ${(c,d)}$ are equal if ${a=c}$ and ${b=d}$.

Build a class `Vector2D` where the above mathematical operations are implemented by special methods. The class must contain two data attributes `x` and `y`, one for each component of the vector. It must include special methods for addition, subtraction, the scalar product (multiplication), the absolute value (length), comparison of two vectors (== and !=), as well as a method for printing out a vector and the number of dimensions (in that case, it is always 2).

Your program must be written in `src/vector2d.py`. You should be able to instanciate circles and play with them directly from your iPython console.