Computing Methods for Physics 1

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Hands-on lab session 1, A.Y. 2022-23

Design and implement a C++ class with name `Vector3D` to handle mathematical operations involving vectors in $\mathbb{R}^3$.

- Pick appropriate data members.
- Implement constructors of all kinds you think may be of use.
- Implement setters.
- Implement member functions `scalarProduct()`, `vectorProduct()`, `magnitude()`, `theta()`, and `phi()`.
- Implement the function `angle()` to calculate and return the angle between two vectors.
- Overload operators `+`, `-`, and `=`.
- Overload the operators `*` and `/` so that you can multiply or divide a vector by a double.
- Ensure you can handle both spehrical and cartesian coordinate systems.

Write an application in which you try out your `Vector3D`. In particular, ask the user to decide how many vectors they want to input, have them input the cartesian corodinates of these vectors and calculate and print to screen the magnitude of each one.

COMMENT YOUR CODE!!! KEEP IN MIND THE BASIC CHECKLIST:

1. Does the code compile?
2. Does it run?
3. Does it produce meaningul and correct output?

And, of course... could it be faster?