



Physico or Physicopy

24.05.2021

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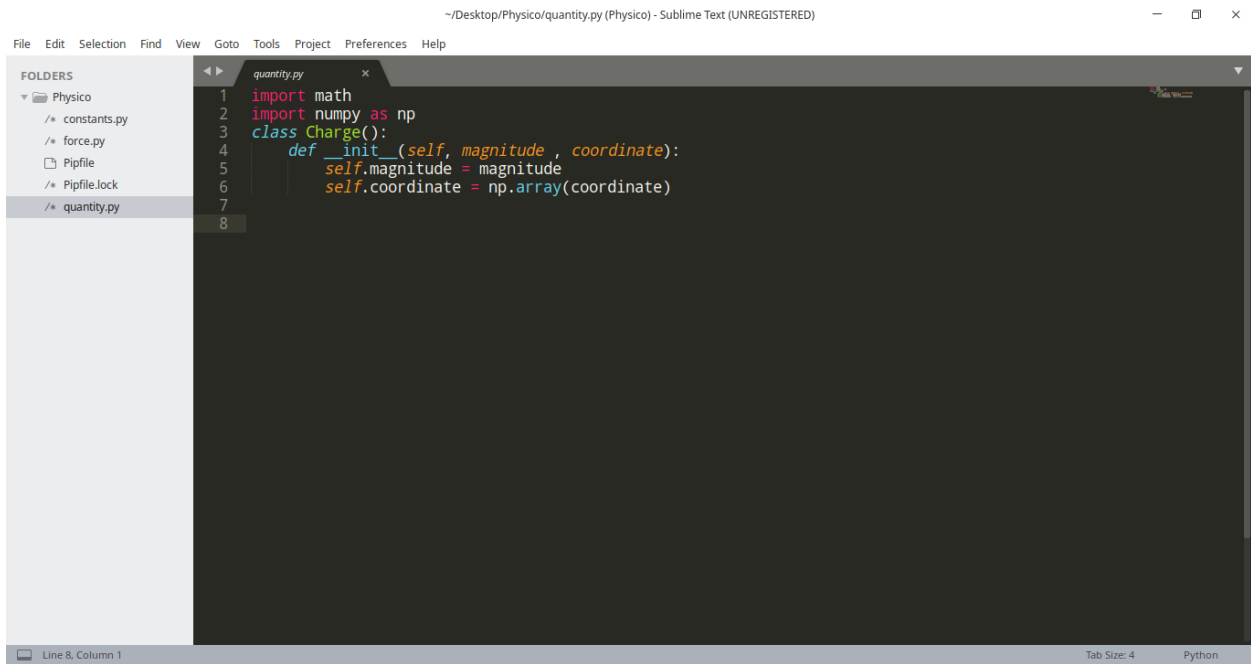
Overview

A Python project to solve basic physics problems.

Till now I have created a quantity.py file which contain a Charge Class which has arguments of Magnitude and Coordinate. For more info about charge please visit:

https://en.wikipedia.org/wiki/Electric_charge

Quantity.py



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~/Desktop/Physico/quantity.py (Physico) - Sublime Text (UNREGISTERED)
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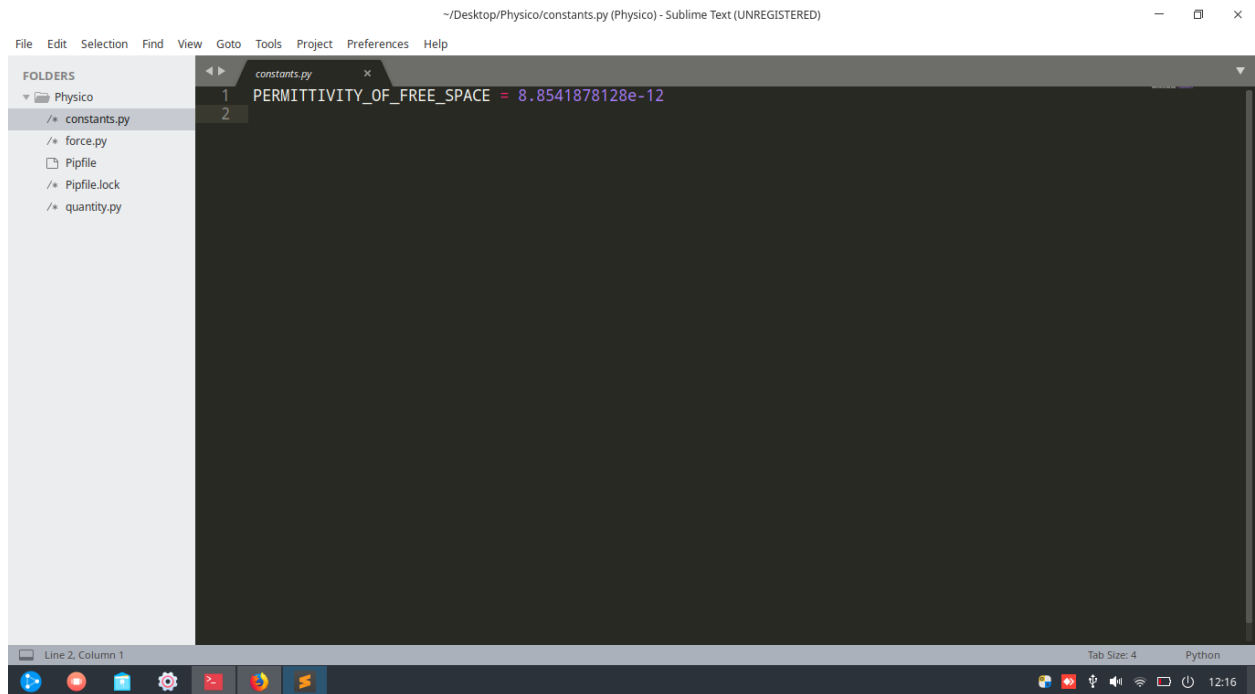
FOLDERS
▼ Physico
  /* constants.py
  /* force.py
  Pipfile
  /* Pipfile.lock
  /* quantity.py

quantity.py
1 import math
2 import numpy as np
3 class Charge():
4     def __init__(self, magnitude, coordinate):
5         self.magnitude = magnitude
6         self.coordinate = np.array(coordinate)
7
8
```

Line 8, Column 1 Tab Size: 4 Python

A constants.py file which contains physical constants and their values.

constants.py



Anyone who is free please add this constants to the constants.py file in github

c	velocity of light in vacuum	$2.997\,924\,58 \cdot 10^8 \text{ m/s}$
h	Planck's constant	$6.626\,069 \cdot 10^{-34} \text{ J/s}$
\hbar	($= h/2\pi$)	$1.054\,571 \cdot 10^{-34} \text{ J/s}$
e	electronic charge	$1.602\,176 \cdot 10^{-19} \text{ C}$
μ_e	electron magnetic moment	$-928.476\,362 \cdot 10^{-26} \text{ J/T}$
μ_B	Bohr magneton	$927.400\,899 \cdot 10^{-26} \text{ J/T}$
μ_N	nuclear magneton	$5.050\,783\,17 \cdot 10^{-27} \text{ J/T}$
m_e	electron mass	$9.109\,381\,88 \cdot 10^{-31} \text{ kg}$
m_p	proton mass	$1.672\,621\,58 \cdot 10^{-27} \text{ kg}$
m_N	neutron mass	$1.674\,927\,16 \cdot 10^{-27} \text{ kg}$
k_B	Boltzmann's constant	$1.380\,650 \cdot 10^{-23} \text{ J/K}$
N_A	Avogadro's constant	$6.022\,142 \cdot 10^{23}$
R	molar gas constant	$N_A \cdot k_B = 8.314\,472 \text{ J/mol}\cdot\text{K}$
F	Faraday constant	$96\,485.3415 \text{ C/mol}$

And lastly a force.py file which is used to calculate forces between two charges and it takes the argument. More info here : https://en.wikipedia.org/wiki/Coulomb%27s_law

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~/Desktop/Physico/force.py (Physico) - Sublime Text (UNREGISTERED)
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FOLDERS
  Physico
    /* constants.py
    /* force.py
    Pipfile
    /* Pipfile.lock
    /* quantity.py
force.py
1  from quantity import Charge
2  import numpy as np
3  import constants
4  import math
5
6  class ForceBetweenTwoChargedParticles():
7
8
9
10 def getForce(self, onCharge, dueToCharge):
11     self.onCharge = onCharge
12     self.dueToCharge = dueToCharge
13
14     self.d = np.linalg.norm(self.onCharge.coordinate - self.dueToCharge.coordinate)
15     magnitude = (1/(4*math.pi*constants.PERMITTIVITY_OF_FREE_SPACE))*self.onCharge.magnitude*s
16     return magnitude
17
18
19
20
21
22
Line 18, Column 1
Tab Size: 4 Python
12:21

```

Goals

1. Till now I have only calculated the magnitude of the Force but We have to implement a vector form of the Force. More info regarding vectors can be found here.
<https://www.khanacademy.org/math/precalculus/x9e81a4f98389efdf:vectors/x9e81a4f98389efdf:component-form/a/vector-magnitude-and-direction-review>
2. We have to implement Vector addition so as to upgrade from Force due to two charge systems to n- charge systems.
https://www.varsitytutors.com/hotmath/hotmath_help/topics/adding-and-subtracting-vectors

Specifications

1. I have used pipenv to work on this project which can be easily installed using
2. pip or pip3 install pipenv.
3. Then go to the project folder and type pipenv shell.
4. And finally to install all the dependencies like numpy use pipenv install --dev Or pipenv install