G12_11-OOP-T3-MiniAssignment-1

February 7, 2020

1 Complex Numbers

These numbers are similar to vectors.

In this case we have a multiplication of two such numbers that gives us a new complex number. This we didn't have for vectors.

Say $u = (u_x, u_y)$ and $w = (w_x, w_y)$ are two such complex numbers. The product $u \cdot w$ is defined as

$$z = u \cdot w = (z_x, z_y)$$
$$z_x \equiv u_x \cdot w_x - u_y \cdot w_y$$
$$z_y \equiv u_x \cdot w_y + u_y \cdot w_x$$

Besides the product, we also have the addition of complex numbers, the multiplication by a scalar (i.e., a number), and norm.

But complex numbers also have inverse and thus division.

Norm |u|

$$|u|^2 = u_x^2 + u_y^2$$

Inverse u^{-1}

$$u^{-1} = \frac{1}{|u|} (u_x, -u_y)$$

We call the complex number $(u_x, -u_y)$ the **conjugate of u**, \bar{u}

2 Assignment Due: Mo. Feb 10. 2020

Implement a class Complex for working with complex numbers.

Make sure to implement the features shown in the following examples.

[47]: v = Complex(1,1) v

[47]: 1 + j 1

[48]: v.norm()

[48]: 1.4142135623730951

[39]: v.conj

[39]:	1 - j 1
[40]:	z = Complex(-2, -3)
[40]	
[40]:	-2 - j 3
[42]:	$M = \Lambda * \Sigma$
[42]:	1 - ј 5
[49]:	w.norm()
[49]:	5.0990195135927845
[]:	