# Lab 1: Complex Numbers Calculator

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A Complex Number is a combination of a **Real Number** and an **Imaginary Number**.

**Real Numbers:** nearly any number you can think of is a **Real Number!**

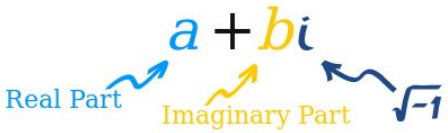
Examples: 1, 12.38, −0.8625, 3/4, √2, 1998

**Imaginary Number:** a number when squared gives a negative result. Normally this doesn't happen, But just imagine such numbers exist, because we will need them.

Examples of Imaginary Numbers: 3**i**, 1.04**i**, −2.8**i**, 3**i**/4, (√2)**i**, 1998**i**, where **i** = √**-1**

**Complex Numbers**:

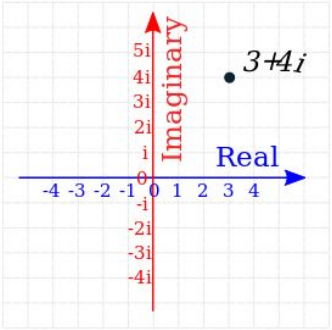
A Complex Number is a combination of a **Real Number** and an **Imaginary Number**:




Examples:

| | | | | |
|---|---|---|---|---|
| 1 + i | 39 + 3i | 0.8 − 2.2i | −2 + πi | √2 + i/2 |

A complex number can now be shown as a point:




The complex number 3 + 4**i**

## Adding:

To add two complex numbers we add each part separately:(a+bi) + (c+di) = (a+c) + (b+d)i

Example: add the complex numbers **3 + 2*i*** and **1 + 7*i***

- add the real numbers, and
- add the imaginary numbers:

$$(3 + 2i) + (1 + 7i)$$
$$= 3 + 1 + (2 + 7)i$$
$$= 4 + 9i$$

## Multiplying

To multiply complex numbers use this rule:

$$(a+bi)(c+di) = (ac-bd) + (ad+bc)i$$

Example: $(3 + 2i)(1 + 7i) = (3\times1 - 2\times7) + (3\times7 + 2\times1)i = -11 + 23i$

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You are required to implement using the Ruby programming language a 'ComplexNumber' class which supports set of functions for the complex calculator app:

1. +(ComplexNumber cn1)
   Which adds cn1 to its object.
2. ***(ComplexNumber cn1)
   Which multiply cn1 by its object.
3. **bulk_add**(ComplexNumbers[] cns)
   Which takes array of complex numbers and return their sum.
4. **bulk_multiply**(ComplexNumbers[] cns)
   Which takes array of complex numbers and return their multiplication.
5. **get_stats**()
   Which returns how many times the calculator used categorized by the operations types.

Src: https://www.mathsisfun.com/numbers/complex-numbers.html