English Name: ____________________

Worksheet: Simple `Vector` Class

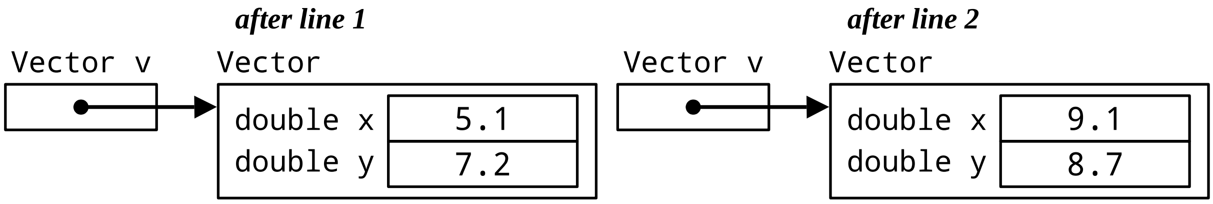
Follow the steps to design a final two-dimensional `Vector` class.

a) Write a class named `Vector` that contains only two fields, named `x` and `y`, both of type `double`.

b) Write a **constructor** for the above `Vector` class that takes two parameters of type `double` that are used to initialize the fields of the class. Do not include class information.

c) Examine the code segment and diagrammatic representation of memory structures, below:

```
1 Vector v = new Vector(5.1, 7.5);
2 v.add(4.0, 1.5);
```

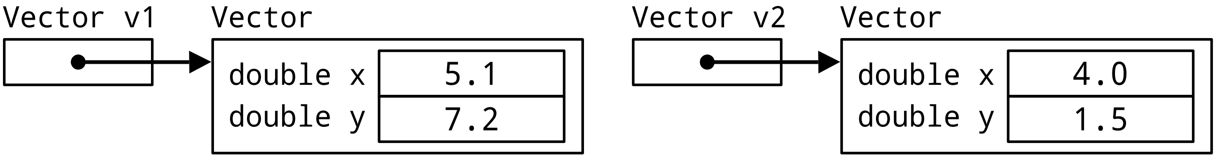


In the space below, write the **method** named `add` for the class `Vector`. It is to operate on a `Vector` object, not return any value, and take two parameters, `x` and `y`, both of type `double`. The method is to add the parameter values to the respective fields of the current object, with result as shown in the diagrams above.

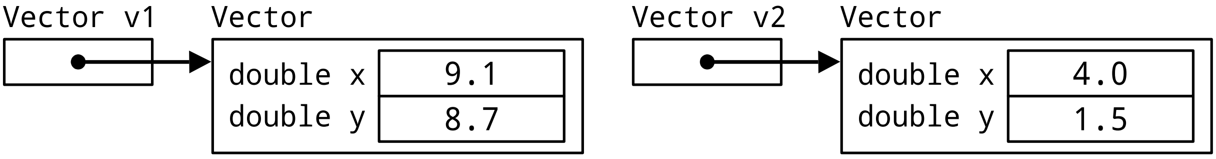
d) Examine the code segment and diagrammatic representation of memory structures, below:

```
1 Vector v1 = new Vector(5.1, 7.5);
2 Vector v2 = new Vector(4.0, 1.5);
3 v1.add(v2);
```

after line 2



after line 3



Write another **method** named `add` for the above `Vector` class (overload the `add` method). This method is to return no value, and take a single parameter, `v`, of type `Vector`. It is to add the fields of the `v` object to the respective fields of the current object, with results as shown in the diagrams above.

e) Write a **method** named `equals` for the above `Vector` class. This method is to take a single parameter, `v`, of type `Vector`. It is to return `true` if both the `x` and `y` fields of the parameter object, `v`, are equal to the `x` and `y` fields, respectively, of the current object.