Reference Semantics

Complete the questions below with the aid of your textbook, notebook, online or classroom resources you choose. You may work on these problems with a partner, but all of your answers must be your own. The first question has been answered for you as an example.

*Example:*

1. Write sample code and draw a picture of what memory looks like when you declare an integer variable.

1. Write sample code and draw a picture of what memory looks like when you construct an array object.

*Arrange your answer to the next two questions in the graphic organizer on the next page:*

1. What is one thing that reference semantics and value semantics have in common?
2. How do reference and value semantics differ? List at least 2 differences.

**Reference Semantics**

**Value Semantics**

1. When you work with objects, are you referring to stored data or references to the data? Draw a picture to illustrate your answer.
2. List 2 reasons that reference semantics are important to object oriented programming.
3. Why does a method to swap 2 array elements work correctly when a method to swap two integers does not? You may draw a picture to illustrate your answer, but a drawing is not required for this question.
4. Rearrange the following code segments to create multiple references to the same object, as show in the illustration below.

|  |  |  |  |
| --- | --- | --- | --- |
| 1.3 | 1.6 | 2 | 2.3 |

arr1

arr2

|  |  |  |  |
| --- | --- | --- | --- |
| 1.3 | 1.6 | 2 | 2.3 |

arr3

Rearrange these code segments so they execute memory symbolized by the picture above:

double[ ] arr3 = arr2;

}

arr1[j] = j / 3.0 + 1;

double[ ] arr1 = new double[4];

arr2[j] = j / 3.0 + 1;

for (int j = 0; j < arr1.length; j++){

double[ ] arr2 = new double[4];

1. Draw a picture that illustrates why you can’t use a == test to compare 2 objects for equivalence. Be sure to label your illustration for clarity!
2. Draw a picture that illustrates the difference between a null object and setting a variable to an empty string. Be sure to label your illustration for clarity!