

## CS142 Introduction to Object Oriented Programming

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### Lab 4: More on Methods

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Download the `PassByValue.java` program from Moodle. Run the program and make sure you can answer all of the questions that are included in the code as comments (there are six in total). Make sure you understand your answers. Draw a pictorial representation of what's happening in memory in the pass By value model. Write down any outstanding questions you have as we will cover this topic again next week.

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Q1. Write a Java method called `detectDuplicateLetter()` that takes in a `String` as its only parameter. Your method should print the message "Duplicate letter found" only if any of the letters in the `String` are repeated. Otherwise your method should not print any message.

Q2. Write a Java method called `detectPalindrome()` that takes in a `String` as its only parameter. Your method should print the message "Palindrome identified" only if the entire `String` is spelled the same backward as forwards. Otherwise your method should not print any message.

Q3. Place all of the following methods into a class called `ArrayProcessing`. Your `main()` method should be used to call each of the methods below.

- Write a static method called `makeIntArray()` that fills a static array with 100 random int values between 0 and 200.
- Write a static method called `printArray()` to print out the contents of an array to the screen.
- Write a static method called `dotProduct()`. The method should accept two 1D int arrays (created in main and passed as parameters) and should return the dot product of the arrays. The dot product is the sum of the products of the corresponding entries in the two arrays i.e. multiply the values at position 0 in each array and add this value to product of the values at position 1 and add this sum value to the product of the values at position 2 and continue to position n-1 etc.
- Write a static method called `findMax()`. The method should accept a 1D int array (created in main) and should return the largest value in the array.
- Write another static method called `findMax()`. The method should return the largest value in the static array.