

2. Iterative Statements, Methods, Arrays and Recursion

- (a) Write a method that, when called with a single integer argument, n , creates an array of n integers with random values between 0 and 100 inclusive. [5]
- (b) Describe what is meant by method overloading. Using your answer to (a), provide an example of an overloaded method that can be used to set the maximum random value. [3]
- (c) Write a method that, when called with an array and an integer argument, s , performs a linear search on the array reporting the array index of the first instance of s in the list, or returning -1 if s is not found in the array. [6]
- (d) Finally, write a recursive method that calculates the sum of the differences between opposing pairs (i.e. the difference between $A[0]$ and $A[n-1]$, $A[1]$ and $A[n-2]$, and so forth). For example, the array $\{ 3, 6, 34, 65 \}$ results in the calculation: $(65 - 3) + (34 - 6) = 90$.
You may assume the list will always be even in length. [6]