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]