AP COMPUTER SCIENCE   Project 9 - Arrays
DR. PAUL BAILEY   Wednesday, October 2, 2019

Due Wednesday, October 16, 2019, at or before 2359 military time. Zip and send source code of all Java programs to via email to `paul.bailey@basised.com`. Please rename the zip file so it has your name on it in the format `LastFirst_P9.zip`. Also, put your name in a comment on the top of each program. Send source code of all Java programs to via email to `paul.bailey@basised.com`.

You may NOT use any of Java's standard libraries relating to arrays in this project. You must write the algorithms yourself.

Create a new project folder and call it `Arrays`. Inside this folder, create a java program and call it `Arrays.java`. Create a main method and use it to test the methods you will be writing.

Program 1. Create a method `public static int[] randomize(int z)` which accepts an integer z and generates an array of integers of length z with random values between 1 and 100 in each slot.

Program 2. Create a method `public static int[] clone(int[] a)` which accepts an array of integers and returns an array of integers whose entries are exactly the entries of a, but in the same order.

Program 3. Create a method `public static int[] reverse(int[] a)` which accepts an array of integers and returns an array of integers whose entries are the entries of a, but in reverse order.

Program 4. Create a method `public static int maximum(int[] a)` which returns the largest value stored in the array.

Program 5. Create a method `public static int minimum(int[] a)` which returns the smallest value stored in the array.

Program 6. Create a method `public static int count(int[] a, int n)` which returns the number of occurrences of the integer n in the array.

Program 7. Create a method `public static int find(int[] a, int n)` which returns the first position, plus 1, of an occurrence of n of the integer n in the array. For example, if $a = [2, 5, 6, 7, 6]$, then `find(a,6)` would return 3. Return zero if n is not in a.

Program 8. Create a method `public static long sum(int[] a)` which returns the sum of the entries in the array a.

Program 9. Create a method `public static long product(int[] a)` which returns the product of the entries in the array a.

Program 10. Create a method `public static double mean(int[] a)` which returns the mean average of the entries in the array a.

Program 11. (Bonus) Create a method `public static void sort(int[] a)` which sorts the array a.