AP Computer Science
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Project 11 - Arrays
Monday, November 22, 2021

Zip and submit into schoology. Please rename the zip file so it has your name on it in the format `LastFirst_P11.zip`. Also, put your name in a comment on the top of each program.

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.