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/**
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 *
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 */

import java.awt.Point;
import java.io.File;
import java.io.FileNotFoundException;
import java.io.FileWriter;
import java.io.IOException;
import java.io.PrintWriter;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Random;
import java.util.Scanner;

public class FileIO {

	private final static int SEED = 100;

	public static int createFile() { // method to create a code and then write N amount of random numbers
		Random rnd = new Random(SEED);
		Scanner in = new Scanner(System.in);
		System.out.println("Enter an integer to generate N random numbers: ");
		File file = new File("numbers.txt");
		int amount = in.nextInt();
		int temp = 0;
		double random = 0;
		FileWriter fw = null;
		PrintWriter pw = null;

			try {
				fw = new FileWriter(file);
				pw = new PrintWriter(fw);

				for(int i = 0; i < amount; i++) {
					random = (Math.random()*100); //generates the random number to be put on the file
					temp = (int) random;
					pw.printf(temp + "\n");
				}

			} catch (IOException e) {
				e.printStackTrace();
			}	finally {
				try {
					pw.close();
					fw.close();
				} catch(Exception f) {
					f.printStackTrace();
				}
			}


			return amount;
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	}

	public static void readFromFile(int[] arrayOfIntegers) { //takes the numbers from the file and puts them into an array

		Scanner file = null;

		try { //tries to scan the input file and add integers to the array of integers
		file = new Scanner(new File("numbers.txt"));

		for(int i = 0; file.hasNextInt(); i++) {
			arrayOfIntegers[i] = file.nextInt(); //sets index i in the array to a value from the file
		}

	}catch(Exception e) { // if there are any other errors for any reason it will report it
		e.printStackTrace();
	}finally {
		try {
			file.close(); // closes the scanner to prevent data loss
		}catch(Exception f){ // if there is an error closing the scanner it will report it
			f.printStackTrace();
		}
	}




	}

	public static void writeToFile(int[] arrayOfIntegers) { // a method that writes to the file with the correct resuts
		FileWriter numberAppender = null;
		PrintWriter append = null;
		try {
			numberAppender = new FileWriter("numbers.txt");
			append = new PrintWriter(numberAppender);
			int totalParts = 7; // amounts of parts that should be appended

			String number = numbers(arrayOfIntegers);		//runs a whole bunch of methods i made to then make the parts to be put into an array and then
			String sorted = sortArray(arrayOfIntegers);		// written to the numbers.txt file
			String odds = "" + odds(arrayOfIntegers);
			String evens = "" + evens(arrayOfIntegers);
			String smallest = "" + small(arrayOfIntegers);
			String largest = "" + largest(arrayOfIntegers);
			String mean = "" + meanNumb(arrayOfIntegers);

			String[] strings = new String[] {"Numbers: " + number , "Sorted Numbers: " + sorted , "Number of odd numbers: " + odds, //string array of parts
												"Number of even numbers: " + evens, "Smallest Number is "+ smallest,
												"The Largest
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Number is "+ largest, "Mean: "+ mean}; //String Array of All Parts


                  for(int i = 0; i<totalParts; i++) {
                        append.println(strings[i]); // appends file to contain all
the data
                  }
            } catch (IOException e) {
                  e.printStackTrace();
            }finally {
                  try {
                        numberAppender.close();
                        append.close();
                  } catch (IOException e) {
                        e.printStackTrace();
                  }

            }
      }

      public static String numbers(int[] arr) { // builds a string of numbers
before sorting
            String arrString = "[";

            for(int i = 0; i<arr.length; i++) {
                  if(i < arr.length-1) {
                        arrString = arrString + arr[i] + ", ";
                  }else {
                        arrString = arrString + arr[i] + "]";
                  }
            }

            return arrString;
      }


      public static String sortArray(int[] arr) { //sorts the array from smallest
to largest then returns a string
            Arrays.sort(arr);
            String arrString = "[";

            for(int i = 0; i<arr.length; i++) {
                  if(i < arr.length-1) {
                        arrString = arrString + arr[i] + ", ";
                  }else {
                        arrString = arrString + arr[i] + "]";
                  }
            }

            return arrString;
    }


      public static int odds(int[] arr){ // returns amount of odd numbers
            int odds = 0; //initial amount of even numbers

            for(int i = 0; i<arr.length;i++) {
                   if (arr[i] % 2 != 0 ) { //tests if number is even and adds to
total evens or odds
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                        odds= odds + 1;
                  }
            }
            return odds;
      }

      public static int evens(int[] arr){ // returns amount of even numbers
            int evens = 0; //initial amount of even numbers

            for(int i = 0; i<arr.length;i++) {
                  if (arr[i] % 2 == 0 ) { //tests if number is even and adds to
total evens or odds
                        evens= evens + 1;
                  }
            }
            return evens;
      }

      public static int small(int[] arr) { // returns the smallest number
            int small = arr[0];
            for(int i = 0; i<arr.length; i++) { //prints out sorted array
                        if(arr[i] < small) {
                              small = arr[i];
                        }
            }
            return small;
      }

      public static int largest(int[] arr) { //returns the largest number
            int large = arr[arr.length-1];
            for(int i = 0; i<arr.length; i++) { //prints out sorted array
                  if(arr[i] > large) {
                        large = arr[i];
                  }
      }
            return large;
      }

      public static double meanNumb(int[] arr) { //returns the mean of the numbers
            double total = 0;
            for(int i = 0; i<arr.length; i++) {
                  total = total + arr[i];
            }
            double temp = (total/(arr.length));
            double mean =     (Math.floor(temp*100)/100);

            return mean;
      }


      public static void main(String[] args) {
            // Declare the integer array to use for the rest of the program
            int[] arrayOfIntegers = new int[createFile()];
            readFromFile(arrayOfIntegers);

            writeToFile(arrayOfIntegers);
      }
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}
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