

EGN 3211 – Spring 2023

Homework #4

You have been tasked to process Olympic competitors' times for the 100-meter dash in the 2023 Olympic games. The races are conducted with 5 competitors at a time and there will be two races. You will generate two datasets of runners' times to ensure your solution will work with any given dataset. You will write five functions that perform operations on arrays. Lastly, you will write a main function that calls your functions to create the desired output.

Example Data

Race #1 (Men)	
Competitor	Time (seconds)
Fei Fong Wong	12.58
Usain Bolt	9.51
Yu Tendo	15.65
Fried Justine	10.30
Uther Lightbringer	10.54

Race #2 (Women)	
Competitor	Time (seconds)
Elly Van Houten	9.40
Inugami Korone	14.66
Amy Rose	14.02
Nina Liebert	11.49
Tokoyami Towa	10.07

Function Specifications

Your functions **must** have the following signatures and do what is described.

```
double find_max(double array[], int length);
```

This function takes a double array and its length as parameters and returns the maximum value in the array.

```
double find_min(double array[], int length);
```

This function takes a double array and its length as parameters and returns the minimum value in the array.

```
void combine_arrays(double src1[], int length1, double src2[],  
int length2, double dest[]);
```

This function takes three double arrays as parameters: two source arrays and one destination array. The length of the source arrays is also taken as a parameter. The function will combine them both into the destination array.

```
void print_array(double array[], int length);
```

This function takes a double array as a parameter and prints all of its elements with two decimal points as a comma separated list. For the final element, you should not print a comma and should print a newline instead.

```
void sort_array(double array[], int length);
```

This function takes a double array and its length as parameters and sorts all of the elements in the array from least to greatest.

Main

Your main function must follow the following specifications:

1. Create an array of type double with length 5 and populate it with randomly generated values from 9.00 to 15.99. This will be the men's dataset.
2. Repeat step 1 for the women's dataset.
3. Declare an empty array of type double with length 10. This array will hold your combined dataset.
4. Use your find_min and find_max functions to print out the fastest and slowest times in each dataset.
5. Call your print_array function to print out the men's dataset unsorted.
6. Call your print_array function to print out the women's dataset unsorted.
7. Call your combine_arrays function to merge the men and women datasets into the empty array created earlier.
8. Call your sort_array function to sort the combined dataset from least to greatest.
9. Call your print_array function to print out the sorted combined dataset.

Sample Output

Your output does not and should not be exactly the same as these samples. The data in your output should be randomly generated according to the assignment specifications. **Note:** the sample outputs use the example datasets given in this document. Make sure you are following the assignment specifications and **generating your own random double values** for your dataset.

Sample Output:

The fastest time among the men's race was: 9.51

The slowest time among the men's race was: 15.65

The fastest time among the women's race was: 9.40

The slowest time among the women's race was: 14.66

Men's Data:

12.58, 9.51, 15.65, 10.30, 10.54

Women's Data:

9.40, 14.66, 14.02, 11.49, 10.07

Sorted Combined Dataset:

9.40, 9.51, 10.07, 10.30, 10.54, 11.49, 12.58, 14.02, 14.66, 15.65

Submission Instructions

You need to submit a single .c file. Save your code to a file named “arrayraces.c” and submit it to canvas. You **must** write the main as specified in this document. Your functions **must** have the same return types and input parameters and must perform the specified operations.

Your program MUST include the following header comment:

*/*Student Assignment Submission Form I declare that the attached assignment is wholly my own work in accordance with UCF Academic Policy. No part of this assignment has been copied manually or electronically from any other source (including web sites) or distributed to other students. My name is: LastName FirstName, Date: mm/dd/yyyy */*