Homework 6 CS 110, Programming Fundamentals I, Central Washington University, Computer Science

This is the last of 6 homework assignments, and the entire assignment is worth 100 points. This is an abbreviated homework, so that you have plenty of time to work on your final project.

This assignment focuses on arrays. The questions are worth the point values indicated below (a total of 36 points). The one programming exercise is worth 64 points. If you need help, ask the TAs, come to office hours, make an appointment, etc. Instructions on what to hand in are provided in each section below.

Questions – 36 points

For the end-of-chapter questions listed below, upload the single “Homework 5 Answer Sheet.docx” document to your Canvas account that includes your answers.

Multiple Choice and True/False

1. ( 4 points ) The last subscript in an array is always

a. 100

b. 0

c. -1

d. 1 less than the number of elements

Write answer on answer sheet.

2. ( 4 points ) This array field holds the number of elements that the array has

a. size

b. elements

c. length

d. width

3. ( 4 points ) True or False: Java does not allow a statement to use a subscript that is outside the range of valid subscripts for an array.

4. ( 4 points ) True or False: Both of the following declarations are legal and equivalent:

int [ ] numbers;

int numbers [ ];

5. ( 4 points ) True or False: The values in an initialization list are stored in the array in the order that they appear in the list.

Find the Error, Rewrite correctly, 4 points

6. ( 4 points )

int [ ] hours = 8, 12, 16;

Find the Error, Rewrite correctly, 4 points

7. ( 4 points )

String[] names = { “George”, “Susan” };

int totalLength = 0;

for ( int i = 0; i < names.length(); i++)

totalLength += names[i].length;

Short Answer

8. ( 4 points ) Look at the following array definition:

int [ ] values = new int[10];

a. How many elements does the array have?

b. What is the subscript of the first element in the array?

c. What is the subscript of the last element in the array?

9. ( 4 points ) How do you define an array without providing a size declarator?

Programming Question – Processing Arrays – 64 points

For this programming question, you'll write a single java file, with a main method, and two accessory methods. The pseudocode for the program is shown in below. Hint 1. Create an array of the appropriate size: int[] arrayOfNums = new int[sizeOfArray]. This coding assignment is VERY similar to lab 8, so be sure to refer to it, if you have questions. The main method will:

1. Ask the user to specify how many integer values he/she wants to tally.

2. Create an array of appropriate size, and randomly generate numbers to fill the array.

3. Invoke a method that takes as input an array, and which will sum and print to the screen the values of the array.

4. Invoke a method that takes as input an array, and which will calculate and output to the screen the average, maximum, and minimum values in the array

Pseudocode for a program that creates an array, and calculates the sum, average, maximum, and minimum values of the array:

Sum Method

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Takes as input an array

Returns void

Prints the number of elements in the array and the sum of the entries

Average, Maximum, Minimum Method

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Takes as input an array

Returns void

For the input array, calculates the average, maximum, and minimum entries, and prints/displays them to the user

Main method

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1. Set up Scanner Object

2. Ask user, "How many integer numerical entries do you have?"

3. Read from the keyboard, the user's input, and save that into the variable sizeOfArray

4. Declare an array of size sizeOfArray

5. Use the Random number Class and walk over the array, and input into each slot, a random number

6. Invoke the sum method

7. Invoke the Average, Maximum, Minimum Method

This programming assignment is on purpose open-ended and quite vague. You need to:

• choose the name of the program

• choose the variable names

• choose what type of data (ints or doubles, should the array hold)

• etc.

By this point of the quarter, you should be comfortable writing a short simple program to achieve a simple task. This portion of the homework can be completed with very few lines of code (fewer than 50).