CS211 Homework – 7

Total Marks: 100

Due Date: 11/20/2019

Question *1 of 1*: **Pointer Bug Hunt**: *[100 marks]* Fix the provided code such that the program works according to specifications. Download the provided code ***Pointer_BugHunt.cpp*** from blackboard and replace the source.cpp file with this file.

Specifications:

1. Take input array of integers from the user
    a. User specified array size
    b. Use **new** to allocate memory for array
    c. Get array elements from user as input
2. Print this array to console
    a. Print the array contents in the forward order
    b. Print the array contents in the reverse/backward order
3. Swap the maximum Positive integer in the array with the first array element
    a. Get address of the Maximum Positive integer in the array
        i. Address is null if no positive integer exists
    b. Swap the first array element with the maximum value pointed to by the above address
    c. Print new array with swapped values to console
        i. Print the array contents in the forward order
        ii. Print the array contents in the reverse/backward order
    d. Print the value at the address of the Maximum Positive integer, if positive integer exists
4. Swap the maximum Negative integer in the array with the first array element
    a. Get address of the Maximum Negative integer in the array
        i. Address is null if no Negative integer exists
    b. Swap the first array element with the maximum value pointed to by the above address
    c. Print new array with swapped values to console
        i. Print the array contents in the forward order
        ii. Print the array contents in the reverse/backward order
    d. Print the value at the address of the Maximum Negative integer, if Negative integer exists

Make sure your code works for any input number, not just the test cases. Your code will be tested on other test cases not listed here.

Please properly comment your code before submission. Submit a text report which explains the errors encountered and their respective fixes in your own words. **Name your report file as Pointer_BugHunt_report_WSUID.txt. For example, if your user ID is A999B999 name your file as Pointer_BugHunt_report_A999B999.txt.**

Your report file should include the list of errors and how you fixed them. Please follow the format provided below to record the changes made.

Error #1:
Line number:
Original Statement:
Fixed Statement:
Briefly explain the issue and how it was resolved:

Error #2:
Line number:
Original Statement:
Fixed Statement:
Briefly explain the issue and how it was resolved:

And so on…

In addition to this. Explain why, ***printArrayBackwards*** function works correctly in the current code but ***printArrayForwards*** does not.

For this part of the assignment, name your source file as Pointer_BugHunt_WSUID.cpp. For example, if your user ID is A999B999 name your file as Pointer_BugHunt_A999B999.cpp.

Sample Test Cases :
(Your addresses might vary) (You might see different random numbers for uninitialized/wrong memory addresses):

Test Case 1:
Current Output:

```
Enter the size of your array: 5
Enter array elements:
Element 1 of 5 : -8
Element 2 of 5 : -6
Element 3 of 5 : -2
Element 4 of 5 : 3
Element 5 of 5 : 6
Array contents (Forwards):
-33686019 : -1208138260 : 10460 : 24642624 : 24603792 :
Array contents (Backwards):
6 : 3 : -2 : -6 : -8 :

------------------------------------------------
Finding maximum positive number in array...
Array contents (Forwards):
-33686019 : -1208138260 : 10460 : 24642624 : 24603792 :
Array contents (Backwards):
6 : 3 : -2 : -6 : -8 :
```

*******No positive numbers found in array

Finding maximum negative number in array...
Array contents (Forwards):
-33686019 : -1208138260 : 10460 : 24642624 : 24603792 :
Array contents (Backwards):
6 : 3 : -2 : -6 : -8 :

*******No negative numbers found in array

Expected Output:

Enter the size of your array: 5
Enter array elements:
Element 1 of 5 : -8
Element 2 of 5 : -6
Element 3 of 5 : -2
Element 4 of 5 : 3
Element 5 of 5 : 6
Array contents (Forwards):
-8 : -6 : -2 : 3 : 6 :
Array contents (Backwards):
6 : 3 : -2 : -6 : -8 :

Finding maximum positive number in array...

Swapping elements:
Address 1: 01471090 Value: -8
Address 2: 014710A0 Value: 6

Array contents (Forwards):
6 : -6 : -2 : 3 : -8 :
Array contents (Backwards):
-8 : 3 : -2 : -6 : 6 :

*******Maximum positive number in array: 6

Finding maximum negative number in array...

Swapping elements:
Address 1: 01471090 Value: 6
Address 2: 01471098 Value: -2

Array contents (Forwards):
-2 : -6 : 6 : 3 : -8 :

Array contents (Backwards):
-8 : 3 : 6 : -6 : -2 :

*******Maximum negative number in array: -2

Test Case 2:

Current Output:

Enter the size of your array: 10
Enter array elements:
Element 1 of 10 : -10
Element 2 of 10 : -20
Element 3 of 10 : 5
Element 4 of 10 : 6
Element 5 of 10 : -5
Element 6 of 10 : -8
Element 7 of 10 : 12
Element 8 of 10 : 40
Element 9 of 10 : 32
Element 10 of 10 : -9
Array contents (Forwards):
-33686019 : 3014724 : 7077988 : 108 : -409643667 : 134220966 : 13663184 : 13660440 : 13663192 : 13660448 :
Array contents (Backwards):
-9 : 32 : 40 : 12 : -8 : -5 : 6 : 5 : -20 : -10 :

Finding maximum positive number in array...
Array contents (Forwards):
-33686019 : 3014724 : 7077988 : 108 : -409643667 : 134220966 : 13663184 : 13660440 : 13663192 : 13660448 :
Array contents (Backwards):
-9 : 32 : 40 : 12 : -8 : -5 : 6 : 5 : -20 : -10 :

*******No positive numbers found in array

Finding maximum negative number in array...
Array contents (Forwards):
-33686019 : 3014724 : 7077988 : 108 : -409643667 : 134220966 : 13663184 : 13660440 : 13663192 : 13660448 :
Array contents (Backwards):
-9 : 32 : 40 : 12 : -8 : -5 : 6 : 5 : -20 : -10 :

*******No negative numbers found in array

Expected Output:

```
Enter the size of your array: 10
Enter array elements:
Element 1 of 10 : -10
Element 2 of 10 : -20
Element 3 of 10 : 5
Element 4 of 10 : 6
Element 5 of 10 : -5
Element 6 of 10 : -8
Element 7 of 10 : 12
Element 8 of 10 : 40
Element 9 of 10 : 32
Element 10 of 10 : 9
Array contents (Forwards):
-10 : -20 : 5 : 6 : -5 : -8 : 12 : 40 : 32 : 9 :
Array contents (Backwards):
9 : 32 : 40 : 12 : -8 : -5 : 6 : 5 : -20 : -10 :

-----------------------------------------------
Finding maximum positive number in array...

Swapping elements:
Address 1: 00720418 Value: -10
Address 2: 00720434 Value: 40

Array contents (Forwards):
40 : -20 : 5 : 6 : -5 : -8 : 12 : -10 : 32 : 9 :
Array contents (Backwards):
9 : 32 : -10 : 12 : -8 : -5 : 6 : 5 : -20 : 40 :

*******Maximum positive number in array: 40
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Finding maximum negative number in array...

Swapping elements:
Address 1: 00720418 Value: 40
Address 2: 00720428 Value: -5

Array contents (Forwards):
-5 : -20 : 5 : 6 : 40 : -8 : 12 : -10 : 32 : 9 :
Array contents (Backwards):
9 : 32 : -10 : 12 : -8 : 40 : 6 : 5 : -20 : -5 :

*******Maximum negative number in array: -5
-----------------------------------------------
```

Test Case 3: (All Positive Numbers)

Current Output:

```
Enter the size of your array: 4
Enter array elements:
Element 1 of 4 : 2
Element 2 of 4 : 8
Element 3 of 4 : 4
Element 4 of 4 : 6
Array contents (Forwards):
-33686019 : 23068864 : -1254281758 : 134222054 :
Array contents (Backwards):
6 : 4 : 8 : 2 :

-----------------------------------------------
Finding maximum positive number in array...
Array contents (Forwards):
-33686019 : 23068864 : -1254281758 : 134222054 :
Array contents (Backwards):
6 : 4 : 8 : 2 :

*******No positive numbers found in array
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-----------------------------------------------
Finding maximum negative number in array...
Array contents (Forwards):
-33686019 : 23068864 : -1254281758 : 134222054 :
Array contents (Backwards):
6 : 4 : 8 : 2 :

*******No negative numbers found in array
-----------------------------------------------
```

Expected Output:

```
Enter the size of your array: 4
Enter array elements:
Element 1 of 4 : 2
Element 2 of 4 : 8
Element 3 of 4 : 4
Element 4 of 4 : 6
Array contents (Forwards):
2 : 8 : 4 : 6 :
Array contents (Backwards):
6 : 4 : 8 : 2 :

-----------------------------------------------
Finding maximum positive number in array...
```

Swapping elements:
Address 1: 015E10A0 Value: 2
Address 2: 015E10A4 Value: 8

Array contents (Forwards):
8 : 2 : 4 : 6 :
Array contents (Backwards):
6 : 4 : 2 : 8 :

*******Maximum positive number in array: 8

Finding maximum negative number in array...
Array contents (Forwards):
8 : 2 : 4 : 6 :
Array contents (Backwards):
6 : 4 : 2 : 8 :

*******No negative numbers found in array

Test Case 4: (All Negative Numbers)
Current Output:
Enter the size of your array: 4
Enter array elements:
Element 1 of 4 : -6
Element 2 of 4 : -8
Element 3 of 4 : -2
Element 4 of 4 : -10
Array contents (Forwards):
-33686019 : 19792064 : 1463707205 : 201376493 :
Array contents (Backwards):
-10 : -2 : -8 : -6 :

Finding maximum positive number in array...
Array contents (Forwards):
-33686019 : 19792064 : 1463707205 : 201376493 :
Array contents (Backwards):
-10 : -2 : -8 : -6 :

*******No positive numbers found in array

Finding maximum negative number in array...
Array contents (Forwards):

-33686019 : 19792064 : 1463707205 : 201376493 :
Array contents (Backwards):
-10 : -2 : -8 : -6 :

*******No negative numbers found in array

Expected Output:

Enter the size of your array: 4
Enter array elements:
Element 1 of 4 : -6
Element 2 of 4 : -8
Element 3 of 4 : -2
Element 4 of 4 : -10
Array contents (Forwards):
-6 : -8 : -2 : -10 :
Array contents (Backwards):
-10 : -2 : -8 : -6 :

Finding maximum positive number in array...
Array contents (Forwards):
-6 : -8 : -2 : -10 :
Array contents (Backwards):
-10 : -2 : -8 : -6 :

*******No positive numbers found in array

Finding maximum negative number in array...

Swapping elements:
Address 1: 01441098 Value: -6
Address 2: 014410A0 Value: -2

Array contents (Forwards):
-2 : -8 : -6 : -10 :
Array contents (Backwards):
-10 : -6 : -8 : -2 :

*******Maximum negative number in array: -2
