```cpp
/*****************************************************************************
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 * LAB #       : 1
 * CLASS       : CS1C
 * SECTION     : MW 5:00pm
 * DUE DATE    : 8/19/20
 *****************************************************************************/

#include "header.h"

/*****************************************************************************
 * LAB 1
 * ---------------------------------------------------------------------------
 * This program will generate random numbers, take the unsorted #'s and sort
 * them, then reverse their order. Finally, calculate the sum into a new array.
 * ---------------------------------------------------------------------------
 * INPUT:
 *     <There is no input for this program - output data is obtained through
 *     the srand.>
 *
 * OUTPUT:
 *    <This program will output the three arrays that store the values of
 *    the sorted array, reversed # array, and the sum array. >
 *****************************************************************************/
int main()
{
    const int AR_SIZE = 15;  // CALC - The size of the array

    int numberAr[AR_SIZE];   // CALC - array with size of 15
    int sortedAr[AR_SIZE];   // OUT  - the sorted array
    int reversedAr[AR_SIZE]; //OUT - the reversed array
    int sumAr[AR_SIZE];      //OUT -
    arNum firstNum;
    arNum secondNum;
    int sumIndex;
    int temp;  //CALC - Temporary place holder for a number
    int count; //CALC - LCV
    int indexs; //CALC - index for the array & LCV
    int index; //CALC - allows the array to move to the next node
    int counts; // CALC - LCV
    int reversedIndex;  // CALC       - LCV for the reversed array
    int remainder;      // CALC       - holds the remainder of the # & LCV
    int reversedNumber; // CALC & OUT - the number, but in reserve

    reversedNumber = 0;

    srand(time(NULL)); // generates a random number

    PrintHeader("Random Numbers", 1, 'L');
    cout << "This program will generate random numbers, take the unsorted "
         << "#'s from an " << endl <<   "array and sort them into a new array,"
         << " then reverse their order into a new" << endl << "array. "
         << "Finally, calculate the sum of the digits into a new array."
         << endl << endl;

    cout << "Unsorted Array: ";
    for(index = 0; index < AR_SIZE; index++)
```

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58          {
59
60              numberAr[index] = rand() % 99 + 1;
61              cout << numberAr[index] << " ";
62
63          }//end for(index = 0; index < AR_SIZE; index++)
64
65      for(count = 0; count < AR_SIZE - 1; count++)
66      {
67          for(indexs = 0; indexs < AR_SIZE - 1 - count; indexs++)
68          {
69              if(numberAr[indexs] > numberAr[indexs + 1])
70              {
71                  temp = numberAr[indexs];
72                  numberAr[indexs] = numberAr[indexs + 1];
73                  numberAr[indexs + 1] = temp;
74
75              }//end if(numberAr[index] > numberAr[index + 1])
76
77          }//end for(index = 0; index < AR_SIZE - 1 - count; index++)
78
79      }//end for(count = 0; count < AR_SIZE; count++)
80
81      cout << endl;
82
83      cout << "Sorted array: ";
84
85      for(counts = 0; counts < AR_SIZE; counts++)
86          {
87              sortedAr[counts] = numberAr[counts];
88              cout << sortedAr[counts] << " ";
89
90          }//end for(index = 0; index < AR_SIZE; index++)
91
92      cout << endl;
93
94      cout << "Reversed array: ";
95
96      for(reversedIndex = 0; AR_SIZE > reversedIndex; reversedIndex++)
97      {
98          reversedAr[reversedIndex] = sortedAr[reversedIndex];
99
100         while(reversedAr[reversedIndex] != 0)
101         {
102             remainder = reversedAr[reversedIndex] % 10;
103             reversedNumber = reversedNumber * 10 + remainder;
104             reversedAr[reversedIndex] = reversedAr[reversedIndex] / 10;
105
106         }//end while(reversedAr[reversedIndex] != 0)
107
108         if(reversedNumber < 10)
109         {
110             cout << "0" << reversedNumber << " ";
111         }
112         else
113         {
114             cout  << reversedNumber << " ";
```

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115
116         }//end if(reversedAr[reversedIndex] < 10)
117
118         reversedNumber = 0;
119
120     }//end for(reversedIndex = 14; reversedIndex > -1; reversedIndex--)
121
122     cout << endl;
123
124     cout << "\nThis is the sum of the two digits in one node (53 sum is 8): "
125          << endl;
126
127     for(int index = 0; index < AR_SIZE; index++)
128     {
129         sumIndex = 0;
130         firstNum = sortedAr[index] / 10;
131         secondNum = sortedAr[index] % 10;
132         sumIndex = firstNum + secondNum;
133         sumAr[index] = sumIndex;
134         cout <<  "The sum "<< firstNum <<  " + "
135                           << secondNum  << " = " << sumAr[index] << endl;
136
137     }//end (int index = 0; index < AR_SIZE; index++)
138
139     return 0;
140 }
141
142
143
```