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//File name: array.cpp
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//Creation date: 3/25 2019
/*Synopsis: This program prompts and list the non-negative numbers(ints), finds
  the maximum value in the array, adds the maximum value to each array and list
  the maximum number and the modified array. The input terminated when the list
  is over 20 integers and by -99.
*/


#include<iostream>
#include<cmath>
using namespace std;

//Function prototype for read_list.
//Read the list of number
/* The 3 parameter are the array holding the integers, the number of elements
   in the array and maximum size of the array.
*/
void read_list(int array_int[], int & num_elements, const int array_size);

//Function prototype for print_array.
//displays the values
//The 2 parameters are the array holding integers and the number of elements
void print_array(int array_int[], int num_elements);

//Function prototype for find_max.
//Find maximum values
//The 2 parameters are the array holding the integers and the number of elements
int find_max(int array_int[], int num_elements);

//Function prototype for array_add.
//Adds a number x to every element of an array
//The 3 parameters are the number x, the array and the number of array.
void array_add(int x, int array_int[], int num_elements);

int main(){

  const int array_size = 20;
  int array_int[array_size];
  int num_elements(0);

  //read the list.
  read_list(array_int, num_elements, array_size);

  //print the array.
  print_array(array_int, num_elements);
  cout << endl;
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    //Print the maximum value.
    cout << "The maximum value is " << find_max(array_int, num_elements)
         << endl << endl;

    //Add every array with maximum value.
    array_add(find_max(array_int, num_elements), array_int, num_elements);

    return 0;
}

//Function definition of read_list
/*Read the list for positive number, terminated by -99 or more than 20
integers,
  the list will ignore the negative number and number after -99.
*/
void read_list(int array_int[], int & num_elements, const int array_size){

    int nums(0); //numbers in the array

    cout << "Enter non-negative numbers (ints) terminated by -99: " << endl;
    cin >> nums;

    num_elements = 0;

    while (num_elements < array_size && nums != -99){

        if(nums >= 0){

        array_int[num_elements] = nums;
        num_elements++;

        }

        cin >> nums;
    }

    cout << endl;

}

//Function definition for print_array
//This function print the number in the array and display the number of
values.
void print_array(int array_int[], int num_elements){

    cout << "Original list (" << num_elements << " values):" << endl;

    for (int i = 0; i < num_elements - 1; i++){

        cout << array_int[i] << ", ";

        }
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        cout << array_int[num_elements - 1] << "." << endl;
}

//Function definition for find_max
//This function find the maximum value.
int find_max(int array_int[], int num_elements){

   int max = array_int[0]; //The maximum number

   for(int i = 1; i < num_elements; i++){

      if(array_int[i] > max){

         max = array_int[i];

      }

   }

   return max;

}

//Function definition for array_add
/*This function adds maximum value to each value and dislpay them. */
void array_add(int x, int array_int[], int num_elements){

   cout << "Modified list (" << num_elements << " values):" << endl;
   for(int i = 0; i < num_elements - 1; i++){

      array_int[i] = array_int[i] + x;
      cout << array_int[i] << ", ";
   }

   cout << array_int[num_elements - 1] + x << "." << endl;

}
```