
Arrays

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1

Last Time

- We
 - Started looking at arrays and how they can be used
- Today we will
 - Cover more examples of arrays, as well as investigating how to pass arrays to functions

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2

Problems

- P#1: Write a C++ program segment that will switch the values in the first and third elements of the array
- P#2: Write a C++ program segment that will declare an integer array `nums` of size 100. Then place the first 100 positive even integers into the array `nums` starting with the first element and proceeding to the end of the array
- P#3: A data file of grades exists with an unknown number of characters. Write a C++ program segment that will read these characters into a character array. Assume no more than 1000 characters exists in the data file

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3

Passing Array Elements

```
int i,j;
int arry1[] = {1,2,3,4,5};
int arry2[] = {5,4,3,2,1};

i = 2;
j = 3;

...

void swap (int& num1, int& num2)
{
    int temp;

    temp = num1;
    num1 = num2;
    num2 = temp;
}
```

What happens?

- a) `swap(i, arry1[1]);`
- b) `swap(arry1[2], arry1[3]);`
- c) `swap(arry1[i], arry2[i+1]);`
- d) `swap(i, arry1[1]+i);`
- e) `swap(arry1, arry2);`

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4

Passing arrays to functions

- Can pass individual elements
- If the whole array is passed, it is automatically passed by reference. Why do you think that is?
- The address of the array is passed to the function so that any element of the array can be accessed
- The address of an array is the memory location of the first element

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5

Problem

- Write the function definition for a 'large' function that stores the larger of each element in `arry1` and `arry2` in `arry3`, where `arry1` contains {1, 2, 3, 4, 5} and `arry2` {5, 4, 3, 2, 1}. If the program works, `arry3` should have {5,4,3,4,5}.

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6

Solution

```
void large (int size, int arry1[], int
  arry2[], int arry3[]);
void main()
{
  const int size = 5;
  int arry1[] = {1,2,3,4,5};
  int arry2[] = {5,4,3,2,1};
  int arry3[size];

  large (size, arry1, arry2, arry3);
}
```

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7

Arrays used as input

- What happens when we want to pass arrays to a function to be used only as output? We can't pass it by value...
 - `void large (int size, const int arry1[], const int arry2[], int arry3[]);`
- We can protect array arguments by putting `const` in front of them in prototype and function definition

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8

Problem

- Assume you have two arrays of doubles called `vals1` and `vals2`. They both contain `maxels` elements. Write a C++ `bool` function identical that will accept both arrays and return `true` if both arrays are identical; otherwise, return `false`. The call to your function might be by a statement of the following form:

```
if (identical (maxels, vals1, vals2))
  cout << "Arrays are identical" << endl;
else
  cout << "Arrays are not identical" << endl;
```

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9

Summary

- In today's lecture we covered
 - Passing arrays into functions
- Readings
 - Chapter 4

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10