

LAB EXERCISE

COMPACT



Background:

A common task with array processing might be to traverse a list and eliminate an undesired value. A text file of integers is provided on disk (*compact.txt*) which contains both non-zero and zeroes in random fashion. The number of integers (number ≤ 100) on disk is not given.

Assignment:

1. Write a program that reads a text file (*compact.txt*) and stores the integers in an array. This text file will be provided by your instructor.
2. Write a function *compact* that eliminates all 0's (zeroes) from its array parameter, leaving the relative order of the other elements unchanged. All local variables within this function must be scalar. In other words, you may not use a second array to solve the problem. You must use the following function header.

```
public static int compact (int list[], int N)
// precondition: list contains integers; N is the number of integers in the array (N <= list.length)
// postcondition: all non-zero elements in the array are at the front of the array
// returns: the number of non-zero elements – all of which are at the beginning of the array, N has been updated
```

3. Do not solve the problem by printing out only the non-zero values in the array. Function *compact* must move all non-zero elements to the front of the array.

Instructions:

1. Print out the list both before and after removing the zeros. For example:

Before: 0, 9, 7, 0, 0, 23, 4, 0

After: 9, 7, 23, 4

2. Your program must use proper modular design and parameter passing.

"Introduction to Computer Science" by Cary Matsuoka, published by Institute of Computer Technology,
www.ict.org/apcs.html (modified by Dave Wittry)