ESE-2025 Lab 1

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Introduction

This report will give an understanding of arrays and functions, and will enable us to find the largest integer in a sequence. It will also show the basic usage of pointers in a program.

In our C program, we divide up our code into separate functions where each function has a set of instructions to perform a specific task.

In our first code, we are trying to find the largest number in an array using a function and pointers. The function "`find_largest_int()`" takes in two arguments, the first one is the pointer to the array and the second one is its size. Taking in these parameters, the function returns an int which is the largest element in the array. The function does so by using a basic comparison and checking each element with a temporary variable, the temporary variable if less than the current element(array is iterated through a loop) will be replaced with the current element. This process when repeated on the entire elements in the array will give its largest number. The temporary value is assigned to the first element of the array so that it will not have any garbage values while comparing.
The pointer to the array(which is the name of the array or &array[0]) is passed from the main program to the function along with the size of the array. Using pointer does not have much significance for this current code as we are not modifying anything in the array, however, it makes the program memory efficient as function pointers pass by reference and not pass by value.
The function has to loop through all the elements in the array to pick the largest element and this approach might get slower as the number of elements in the array increases.

Conclusion

This program helps us get more familiarized with functions and pointers.

Appendix

Code:

```
/*
============================================================================
Name        : find_largest.c
Author      : Takis
Revised by  : Shreya on May 30th, 2020
```

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```
Version     : 1.0
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Description : demonstrates the find-largest-integer algorithm
============================================================================
*/


#include<stdio.h>
#include<stdlib.h>

int find_largest_int(int *s,size_t N)
{
      int largest = s[0]; //initialize a variable to the first array element

   //loop to compare "largest" to all elements of the array.
    for(int i=0; i<N; i++)
    {
        if(largest < s[i])
        {
            largest = s[i]; //The largest value till that point is stored in largest
        }
    }
      return largest; //return the largest value in the array
}



int main(void)
{
      int s[]={22,32,9,0,1,2,45,668,932,26,5,3,333,4,7}; // our data array
      size_t N=sizeof(s)/sizeof(int); // number of elements in s

      printf("The largest integer in the array is: %d\n", find_largest_int(s, N));
      printf("find_largest program complete.\n\n");

      return EXIT_SUCCESS;
}
```