60-141
Intro to Algorithms & Programming II Winter 2014

Lab #4: Pointers
(Due at the end of the lab period or beginning of the next)

Objective: Learn to use pointers.

1. Consider the following C program. Assume that memory addresses are expressed in decimal numbers and an integer takes 4 bytes. Also assume **ids = &ids[0] = 2000**. What would be printed by the following program?

```
#include <stdio.h>
int main(){
    int ids[3] = {100,200,300};
    int *salary, salary1, salary2, *salary3;
    salary1 = ids[0] * ids[1];
    salary = &ids[1] ;
    salary2 = *(ids+1)* *(ids+2);
    salary3 = ids+2;
    printf("*salary = %d\nsalary1 = %d\n", *salary, salary1);
    printf("salary2 = %d\nsalary3 = %p\n", salary2, salary3);
}
```

2. Write a function called **Largest** that finds and returns the **address of the largest element** in the array passed to it. (Assume an integer array of size 10). You must use **pointer arithmetic on the array name** instead of the array subscript notation to implement the function.

```
int *Largest( int *array, int size );
```

3. Write a function called **Swap** that takes two integer **pointers** and exchanges the values of each. It returns void. Example: given two integers `'a = 2'` and `'b = 4'`, after **Swap (&a, &b)** is called, `'a'` will be `4` and `'b'` will be `2`.

```
void Swap( int *x, int *y );
```

4. Write a main function (in **Lab3.c**) to test both the functions **Largest** and **Swap**.

EVALUATION:
You need to show your instructor the complete programs at the end of this lab, or at the beginning of your next lab. The marks you will receive for this lab are made of two parts: Lab work marks 8 and **attendance marks 2**. **Total 10 marks**.

Lab Work Mark: You will be evaluated based on your solutions for the problems based on the following scheme:

0 mark = No work done.
2 mark = Incomplete code / does not compile, with no/invalid documentation
4 marks = Complete running program with no/invalid documentation
6 marks = Incomplete code / does not compile, with proper documentation
8 marks = Complete running program with proper documentation

IMPORTANT:
ASK QUESTIONS IF YOU GET STUCK, BUT DO YOUR OWN CODE. ANY CODE SUSPECTED TO BE SIMILAR TO ANOTHER SUBMISSION WILL CAUSE BOTH SUBMISSIONS TO RECEIVE A ZERO MARK ON ALL LABS AND BE REPORTED FOR PLAGIARISM