

CptS 121 - Program Design and Development

Lab 13: Dynamic Memory Allocation

Assigned: Week of April 21, 2014

Due: At the end of the lab session

I. Learner Objectives:

At the conclusion of this programming assignment, participants should be able to:

- 🐾 Apply dynamic memory and pointer manipulation to constructing a linked list

II. Prerequisites:

Before starting this programming assignment, participants should be able to:

- 🐾 Utilize output parameters and pointers in a C program
- 🐾 Apply the dereference or indirection C operator
- 🐾 Declare strings in C
- 🐾 Apply library functions found in <string.h>
- 🐾 Distinguish between character arrays and strings in C
- 🐾 Implement array notation or pointer arithmetic to manipulate strings
- 🐾 Declare arrays in C
- 🐾 Apply arrays in C to various problems
- 🐾 Pass arrays into functions
- 🐾 Initialize arrays using an initializer list
- 🐾 Construct loops to traverse through arrays
- 🐾 Compose iterative statements ("while", "for", and/or "do-while" statements)
- 🐾 Compose decision statements ("if" conditional statements)
- 🐾 Apply top-down design

III. Overview & Requirements:

This lab, along with your TA, will help you navigate through applying dynamic memory allocation.

Labs are held in a “closed” environment such that you may ask your TA questions. Please use your TAs knowledge to your advantage. You are required to move at the pace set forth by your TA. Please help other students in need when you are finished with a task. You may work in pairs if you wish. However, I encourage you to compose your own solution to each problem. Have a great time! Labs are a vital part to your education in CptS 121 so work diligently.

Tasks:

1. Please complete the online survey found at: <http://survey.osble.org/index.php?sid=83956&lang=en>. Recall this survey will help Adam Carter with his res
2. Write a function `insert_in_order ()` that will dynamically place a node in the correct position in ascending order. A node should contain the following information:

```
typedef struct node
{
    int number;
    struct node *next_node;
} Node;
```

Build an appropriate driver to test your function. Your TAs will help step you through finding the last node in the list. They will also help you setup a main driver to test this function! Note this is the kind of data structure work that you will be developing in CptS 122!!!

3. Work on PA 8!

IV. Submitting Labs:

- 🐾 You are not required to submit your lab solutions. However, you should keep them in a folder that you may continue to access throughout the semester. You should not store your solutions to the local C: drive on the Sloan 353 machines. These files are erased on a daily basis.

V. Grading Guidelines:

- 🐾 This lab is worth 10 points. Your lab grade is assigned based on completeness and effort. To receive full credit for the lab you must show up on time and continue to work on the problems until the TA has dismissed you.