

# PERFORMANCE, DATA STRUCTURES AND ALGORITHMS

Exercise 11

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CREATE A single linked list IN C

# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

PURPOSE

The purpose of this exercise is to give you practice with single linked lists in C.

For this exercise you are given a source file that contains some “typedefs” and two functions, “get\_operation” and “new\_node”. Your task is to add functions to create a working program that manages a linked list. The prototypes for the functions you are to create are at the top of the provided source file.

ACTIVITIES

Perform each of the following activities. If you have questions, issues, or doubts, please ask for help and do not just guess.

1. Create the following functions:
2. insert\_node() - this function inserts a node into the linked list such that the list is maintained in ascending order by age.
3. find\_node() - Given an age, this function finds the first node in the list with that age. If there is not a node in the list with that age, the function returns NULL.
4. display\_node() - Prints the values of the fields of a node to the terminal.
5. display\_list() - Prints the nodes of a linked list. This function can print the list in either ascending or descending order by age.
6. Test your program thoroughly to verify that it works correctly. Be sure to include special cases in your testing (e.g. display an empty list).
7. Document your code carefully.
8. In your Engineering Notebook, explain your approach to creating your code and your testing strategy. Include examples of the test input you used and the corresponding output from your program.
9. When you are ready to submit your work, first remove all intermediate files from your src directory.
10. Save and archive your finished C program and upload it to the LMS.