

## Homework 4: Phone Directory

Assigned Wednesday, November 14. The homework must be submitted via email to [tobbetubil214@gmail.com](mailto:tobbetubil214@gmail.com) by **Sunday, November 25** anytime upto midnight (23.59). The subject of the email should say “BIL 214 Homework 4”. Before submitting, place all your files in a directory called “YourFullName-HW4”, **tar and gzip** your directory, and email a single file as attachment. If you deviate from the submission instructions, you lose %5 of your grade.

In this homework, you wil implement a **doubly linked list** to maintain a list of phone directory entries. **Organize your code in multiple .c files in a logical way.** For example code related to linkedlist insertion/deletion can go in one file, menu/input operations can go in another file, etc. You should have the appropriate header files. Submit a makefile with your code.

### Requirements:

- First, define using typedef a structure called **DirectoryEntry** containing **name** and **number** members, both strings(char \*).
- Your program will start by reading a binary file that you get from **argv[1]** which contains a list of DirectoryEntry records, and store them in a doubly linked list of DirectoryEntry structures. Write a function called **load** to do this step. You have to maintain the linked list in alphabetical order of name. Note that initially the file may not exist (which means your directory is empty, and through the menu you will add new entries, and when exiting you will save your list in the file with the given filename.)
- Your program then will display a menu for the user as follows:

```
1 Add Entry
2 Delete Entry
3 Search Entry
5 Print Phone Directory
6 Save and Exit
```

Based on user input, you will have to read more information from the user. For example, if the user wants to add a new DirectoryEntry, you need to read the name and the number from the user, and add that entry into your linked list in sorted alphabetical order of name.

- To do each of the operations in the menu write a separate function. You should have at least the following functions. You may add additional parameters to these functions if you wish.
  1. **void load(char \*filename):** Loads the binary file **filename** into the linkedlist. If **filename** does not exist, start with an empty linked list (nothing to load).

2. **void addEntry(DirectoryEntry entry):** Adds a new `DirectoryEntry` **entry** into the list. When adding a new entry, if the given name already exists in the list, update its number with the new one provided.
3. **void searchEntry(char \*name):** Searches the list for the given **name** and displays the number associated with that entry if the name is found. If the name does not exist in the list, print an appropriate message.
4. **void deleteEntry(char \*name):** Removes the entry with the specified **name** from the list, if found. If the name does not exist in the list, print an appropriate message.
5. **void printPhoneDirectory():** Writes the contents of the Phone Directory to standard output. This output should be in sorted alphabetical order of name.
6. **void saveAndExit():** Writes the contents of the Phone Directory to the same data file you used for loading entries initially.