

# HW 1: Personnel Records in C

Your assignment is to create a program to keep track of the personnel in a fictional organization. It needs to be written in C, and it needs to use a custom `struct` to store every record. The source code file should be called `personnel.c`.

Every record will have three parts:

- A family name.
- A given name.
- A 6-digit ID number.

Upon starting, the program will enter a loop in which it queries the user every time for the next action to take. At no point should the program terminate with fatal errors (even if the user is being deliberately obtuse). The following commands must be implemented:

- If the user enters `exit`, the program will terminate.
- To add a new record, the user must enter a string of the format `+ID/FAMILY/GIVEN`, where `ID`, `FAMILY`, and `GIVEN` are the values for the new record. `ID` must be strictly numerical and non-negative, and it will output a helpful, friendly error if it is not, without adding the record. It should also give a friendly, useful error if the ID number would be a duplicate. The data structure used to store all of these records should be sorted by ID number.
- To remove a record, the user must enter the string `-ID` (a minus sign followed by the record ID). If this ID does not exist in the file, it will say so and do nothing. Otherwise it will print the name of the deleted file, remove the record, and free its memory.
- To see all the records, the user will enter `list`.
- On any other input, the program will output a friendly error message to the effect that it does not understand.

It is up to you which kind of collection (array, array-list, linked list) to use. All of these actions should be linear (or better) in time.

Here is an example of what your program might look like:

```
Welcome to the record keeper! Please enter your instruction:
> +1234/Lovelace/Ada
  Thank you. Ada Lovelace (001234) has been added.
> +5678/Turing/Alan
  Thank you. Alan Turing (005678) has been added.
> +/4321/Babbage/Charles
  I'm sorry. I do not recognize that command.
> +555/al-Khwarizmi/Muhammad
  Thank you. Muhammad al-Khwarizmi has been added.
> list
  Here are the current records:
    Muhammad al-Khwarizmi (000555)
```

```
Ada Lovelace (001234)
Alan Turing (005678)
> -1234
Thank you. Ada Lovelace has been deleted.
> exit
Goodbye!
```

Please allow yourself enough time to do this assignment! Although it would be an easy task in Java, in C you will have to do the allocation and freeing yourself!



— *Est. 1888* —

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