

# Fundamentals of C Programming (48430)

## Assignment 3 Project Report

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# Introduction

This report highlights the functions and features of the program, and also describes the different development stages we have encountered. It outlines the design process of the program to make it user-friendly and easily accessible/readable by the user. It also shows the the functions of the program and describe the development stages such as designing and overcoming problems encountered during the development that our group had went through to get the program to a working status.

## Objective

The main objective of this program is to store the information of vehicle drivers to a file database which is only accessible by authorised staff. The program has several features to add, remove and display the information of several drivers. The type of data the program will be dealing with involves the driver's full name, address, contact details license type and an ID. Because the database is handling sensitive information, encryption will be used to mask the details of drivers in the list. Compression will also be implemented as a way to minimise the file size of the database.

## Scope

The program will:

- Add driver details to a list, with the available inputs;
  - Name - First name (10 character limit), last name (10 character limit)
  - Date of Birth - Day (1-31), month (1-12), year (1900-2001)
  - Address - street number, street name, postcode (1000-2999)
  - Licence details - expiry month (1-12), expiry year (1900-2100), licence type, licence number
- Delete the last driver added to the drivers list
- Delete all drivers in the drivers list
- Search the list by licence type
- Encrypt the list of drivers using substitution cipher
- Compress the list of drivers using Length Encoding
- Decrypt the drivers list
- Decompress the drivers list

## Program Features

The program has various features for the user to utilize for managing the details of drivers. Apart from exiting the program itself, the program has the following accessible functions:

**Adding a driver** - This function simply adds a driver's details to the list. It will ask for details in the following order: last name, first name, date of birth (day, month, year) address and licence type. The driver ID will be automatically generated from the details. There is no limit to how many drivers can be added as their details will be stored in a linked list rather than an array.

**Removing a driver** - A driver can be removed when using this function. There are 3 different ways of removing a driver, the user can choose which method of deletion from the menu. The first method will remove the last driver added to the list. The second method will show the number of drivers currently in the list. The user will then have to choose the number of the driver they wish to remove. Thirdly, the user may remove all drivers from the list.

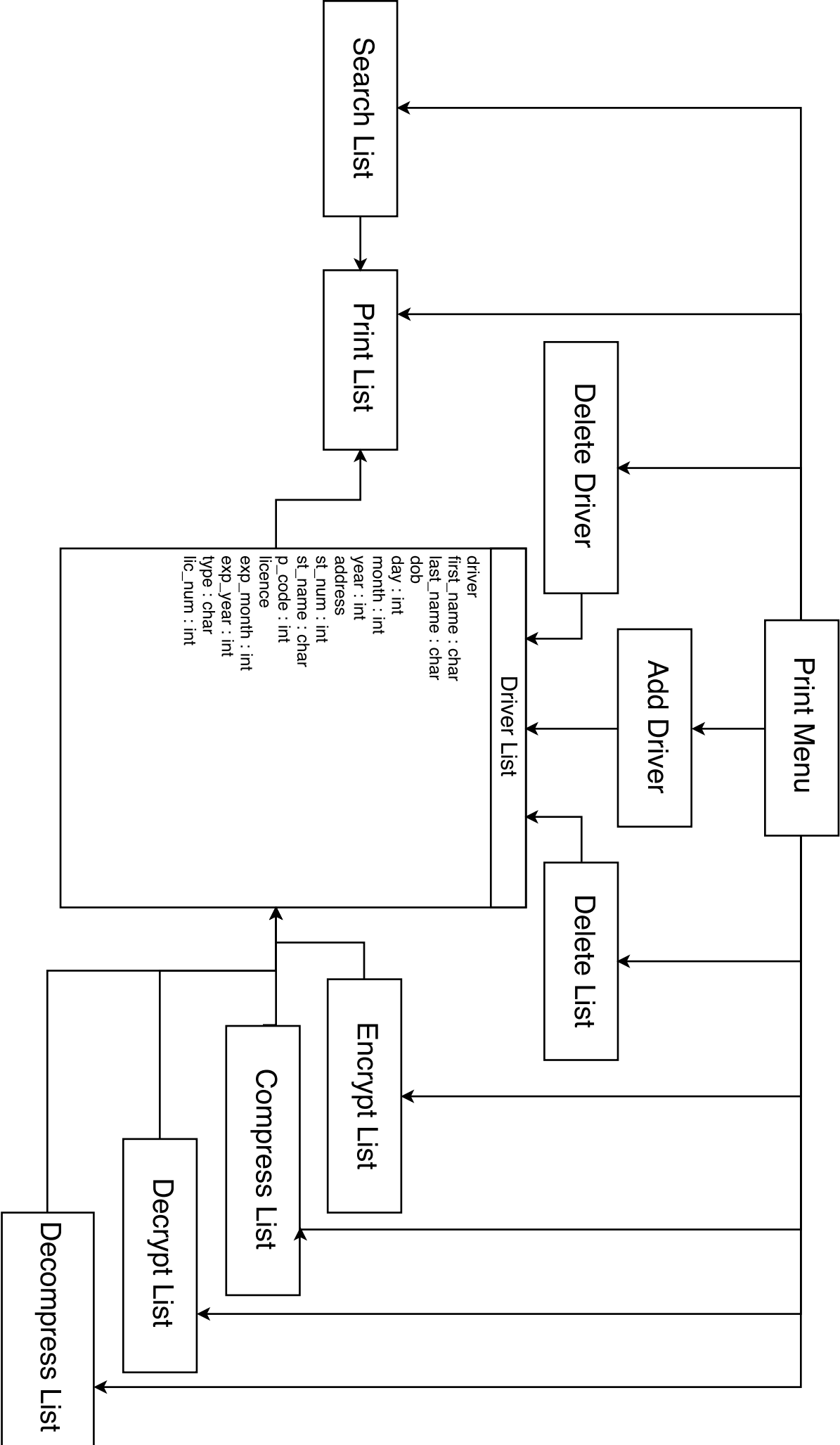
**Display all drivers** - This function simply displays all the driver details in a user friendly format. All details of each driver will be listed in a vertical list. Each driver will have a unique number assigned to them which will help the user identify which driver to delete from the list in the delete menu.

**Encrypt and compress** - The list of drivers can be encrypted and compressed into an external file. This file can only be interfaced with the program. To cater security reasons, the user will require to enter a password before encrypting so that only authorised staff can access the encrypted file. The file will also be automatically compressed to minimise storage use when it will be written onto the computer's storage medium.

**Decompress and decrypt** - Only authorised staff (people who know the pin used to encrypt the driver list) can use this function. This function will initially ask the user for the 4 digit pin before it will decompress and decrypt the external file.

**Erase existing file** - This function will simply delete the external file that the program currently has opened.

# Driver Record Manager Program



Discussion

Design Phase

Development Phase

Testing Phase

# Conclusion