

## COMP10120 Practical Set 9: Linked Lists and Structs

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Please read the questions carefully. Name each program based on your student number, the practical set number and question number. For this set (set9), question 1 should be named 1234567s9q1.cpp where your student number replaces 1234567. All questions that you are submitting can be zipped into a single file called 1234567s9.zip, where 1234567 is your student number and s9 refers to set 9. Please also include a readme.txt file which says which compiler you used to test your implementation. This zipped file must be submitted via Moodle for grading.

1. Write a C code snippet which creates 5 **structs** from the integer array (myCustomers) and writes each struct to a binary file named **customers.dat**. You can assume each struct is defined with the members shown below. The integer array (myCustomers) has 2 columns. Column 0 contains the area/zip code and column 1 contains the number of customers living there available as shown below.

```
int myCustomers [5][2] = {{086956, 1}, {036568, 3}, {006565, 0},
                          {999555, 22}, {85446, 88}};

struct zip_custs{
    int zip_code;
    int customer_count;
};
```

2. A stack is a data structure which can be represented as a linked list. A stack is a constrained version of a linked list because it is a last in first out (LIFO) data structure. Nodes can only be added or removed at the top of the stack. Modify the **C Program** Linked List given in the lecture and on Moodle to create a **stack**. The same functions for adding, removing, printing nodes should be present.
3. A queue is a data structure which can be represented as a linked list. A queue is a constrained version of a linked list because it is a first in first out (FIFO) data structure. Nodes can only be added to the end of the queue and removed from the start of the queue. Modify the **C Program** Linked List p given in the lecture notes and on Moodle to create a **queue** data structure. The same functions for adding, removing, printing nodes should be present.