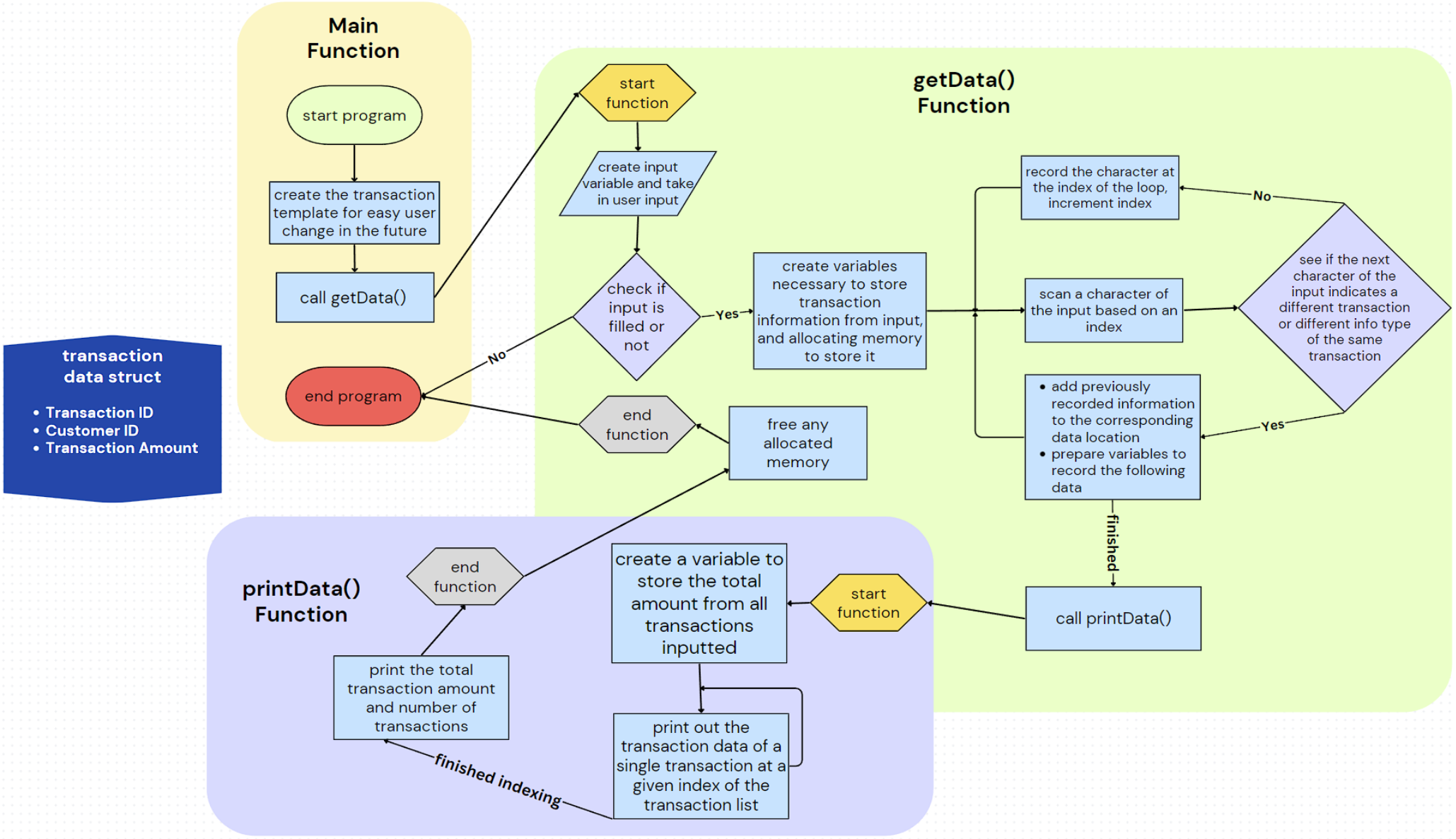
COMP 2401 - Assignment 2 - Design Document

Grant Li - 1012558982

Structure:



Datatype and functionality choices:

The user input should be taken in as a dynamically sized string using a char pointer and “%m”, this will be so that the input itself can be of any size, allowing for any number of transactions in the payload as long as the heap memory has enough space for it and the pointer array.

A pointer array will be used to keep track of each individual transaction from the payload in the form of transaction structs. This is because an array can be easily indexed through given the known size for printing and other modifications.

The “malloc()” method should be used to dynamically allocate memory for the pointer array because the memory next to the allocated data is arbitrary. Therefore, it does not matter what information is next to the allocated memory as it should never be used. Time would be saved using “malloc” as opposed to other dynamic memory allocation functions.

All variables that are used to write data onto the heap memory are static (i.e.: index/info trackers, transaction status indicators, total transaction amount tracker). This is because they only help structure data from the payload into the data structure, and aren’t needed to represent the payload information after they have been used. These variables also don’t have to change in size to accommodate a dynamic user input.

Variables that require a dynamic size to be instantiated should be dynamically allocated in the heap (i.e.: pointer array, raw user payload). This is because these variables directly represent the user’s input, and therefore cannot be static because multiple inputs do not have to be of the same size. Therefore, the size of these variables should be dynamically allocated.