UCSC Silicon Valley Extension

C Programming, Advanced

Assignment 2 : Data structures and graphs
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1. Modify the linked list program in the folder `eclipse-workspace2-ucsc` to change the doubly linked list into a singly linked list in which a list node is declared as follows:

```
struct Node {
      struct Data data;
      struct Node *next;
};
```

Modify the `listInsert`, `listDelete` and `listDeleteAll` operations. What is the running time for the insertion and deletion operations?

2. Examine the program for the B-tree provided in the folder `eclipse-workspace2-ucsc`. Determine what the value of M should be for your operating system. Explain how you arrived at this value.
3. Examine the program for the binary heap provided in the folder `eclipse-workspace2-ucsc`. Note that this is a min heap and the smallest item is at index 1. Modify this program to implement a max heap in which the largest item is stored at index 1. Add a method called `deleteMax` that removes the largest item from the heap. What is the running time for the `insert` and `deleteMax` operations?