CS300 Exam 2 Review

Topics

1. Pointers (int *, char *, void *) … review Adv Pointers lecture and examples we did in class. Tons of potential questions there. Make sure you understand each code snippet … think what else can I ask.
2. Singly Linked List, Singly Linked Circular List
3. Static Queue, Dynamic Queue, Circular Queue
4. Different implementations of various data structures such as numElements vs no numElements member; front, rear, current pointers vs front only; struct containing list pointers vs individual pointers; different initializations of static index pointers for static queue
5. Runtime Stack, Heap, Activation Records

Problems

Consider the following data structure representations:

```
typedef struct Node *NodePtr;
typedef struct Node
{
  char data;
  NodePtr psNext;
} Node;

typedef struct List *ListPtr
typedef struct List
{
  NodePtr psHead;
  int numElements
} List;

typedef struct DQueue *DQueuePtr;
typedef struct DQueue
{
  NodePtr psFront, psRear;
  int numElements;
} DQueue;

#define MAX_QUEUE 10
typedef struct SQueue *SQueuePtr;
typedef struct SQueue
{
  char data[MAX_QUEUE];
  int front, rear;
} SQueue;
```

1) Write a function that accepts a ListPtr and returns true if the list is alphabetically increasing; otherwise, return false.

2) Write a function that accepts a ListPtr and returns a pointer to an exact copy of the list that was passed in.

3) Write a function qSize that accepts an SQueuePtr and returns the number of elements in the queue. Notice there is no numElements.

4) If DQueue only has a single pointer psAccess, write a function qEnqueue that accepts a DQueuePtr and a char value. Enqueue the char value assuming the queue is implemented as a singly linked circular list.