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CPSC 1160 Algorithms and Data Structure I

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Lab07 PART 2 C

DeQueue ADT represents the queue using a double ended queue. For that we use a linked list, which is a discontiguous data structure: Data is allocated in the list at different locations. Hence, knowing the location of one value does not tell you anything about predecessors or successors or any other values.

The array representation used in PART 2 B is a contiguous data structure: All values are stored together in a large block. A value is located immediately after its predecessor and immediately before its successor.

Differences between the two representations:

contiguous storage

- Minimum amount of space required for data storage (typically has wasted space)
- Compatible with modern memory systems because values are not fragmented
- Data location in constant time

discontiguous storage

- Currently-stored items only memory usage (despite it requires more space per item for address pointer representation)
- No movement required on the elements of the queue for data insertion-deletion
- O(n) : all the remaining elements have to be shifted

There is no single best implementation, everything will depend on your requirements, either contiguous or discontiguous representations may be the best suited in terms of space and time efficiency.