**Problem 2: Comparison**

Linked List

N Memory Used (KB) Time (ms)

1000 0 0

2000 0 0

4000 0 40

8000 0 140

16000 0 540

32000 500 2230

64000 1500 9000

128000 3500 35640

256000 7500 252890

Dynamic Array

N Memory Used (KB) Time (ms)

1000 0 0

2000 0 0

4000 0 20

8000 0 100

16000 0 390

32000 0 1530

64000 0 6100

128000 136 24570

256000 644 97810

Which of the implementations uses more memory? Explain why.

Linked lists because it holds the value, next, and prev; while the dynamic array just holds the value.

Which of the implementations is the fastest? Explain why.

Dynamic array because the big-o notation for searching a dynamic array search is O(1); while the big-o for a linked list search is O(N).

Would you expect anything to change if the loop performed **remove()** instead of **contains()**? If so,what?

The linked list remove() would be slightly faster because the dynamic array has to resize itself.