Laboratory 11: Cover Sheet

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Name __Henry Huffman_____ Date _____11/4/14_____

Section _____1001_____

Place a check mark in the *Assigned* column next to the exercises your instructor has assigned to you. Attach this cover sheet to the front of the packet of materials you submit following the laboratory.

Activities	Assigned: Check or list exercise numbers	Completed
Implementation Testing	⬜	
Programming Exercise 1		
Programming Exercise 2		
Programming Exercise 3		
Analysis Exercise 1	x	
Analysis Exercise 2	x	
	Total	

Laboratory 11: Implementation Testing

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Section _____

Check with your instructor whether you are to complete this exercise prior to your lab period or during lab.

Test Plan 11-1 (Heap ADT operations)			
Test case	**Commands**	**Expected result**	**Checked**

Laboratory 11: Programming Exercise 1

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Test Plan 11-2 (Priority Queue simulation results)		
Time (minutes)	Longest wait for any low priority (0) task	Longest wait for any high priority (1) task
10		
30		
60		

Question 1: Is your priority queue task scheduler unfair—that is, given two tasks T_1 and T_2 of the same priority, where task T_1 is enqueued at time N and task T_2 is enqueued at time $N + i$ ($i > 0$), is task T_2 ever dequeued before task T_1?

Question 2: If so, how can you eliminate this problem and make your task scheduler fair?

Laboratory 11: Programming Exercise 2

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Test Plan 11-3 (heapSort operation)			
Test case	Array	Expected result	Checked

Laboratory 11: Programming Exercise 3

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Test Plan 11-4 (The writeLevels operation)			
Test case	**Commands**	**Expected result**	**Checked**

Laboratory 11: Analysis Exercise 1

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You can use a heap—or a priority queue (Programming Exercise 1)—to implement both a first-in, first-out (FIFO) queue and a stack. The trick is to use the order in which data items arrive as the basis for determining the data items' priority values.

Part A

How would you assign priority values to data items to produce a FIFO queue?

Priority values are based upon the time the data items arrive. The data items that enter first are of the highest priority, where as the later values are of a lower value.

Part B

How would you assign priority values to data items to produce a stack?

The data items received last are given the highest priority, and the earlier data items are given a lower priority value.

Laboratory 11: Analysis Exercise 2

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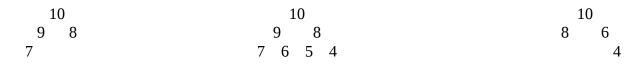
Section _____1001_____

Part A

Given a heap containing ten data items with distinct priorities, where in the heap can the data item with the next-to-highest priority be located? Give examples to illustrate your answer.

The higher priorities will be located on succeeding levels of n^2, with the highest value located at the top. The values of next-to-highest priority are the children of the highest priority data item.

```
     10                    10                    10
   9    8                 9                       8
```

Part B

Given the same heap as in Part A, where in the heap can the data item with the lowest priority be located? Give examples to illustrate your answer. .

It can be located at the lowest level of the heap.

```
      10                        10                            10
    9    8                    9     8                        8    6
   7                        7  6  5  4                            4
```

7 is the lowest value   4 is the lowest value   4 is the lowest value