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This program uses an implemented heap algorithm template class for the ADT Heap. This program also displays the heap tree and runs sort time comparisons with Heap, PriorityQueue and PriorityHeapQueue.

Data Structures 2

Heap

**Reason for Test Case \_\_\_\_\_\_\_\_ Input Values\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_Expected Output**

Display Heap/Queues – w/out nodes heap is empty,

Priority queue is empty Heap is empty!

Priority heap queue is empty PriorityQueue is empty!

select display heap/queue PriorityHeapQueue is empty!

Display Heap/Queues – int nodes insert 3 : priority 1 Heap:

Insert 2 : priority 2 (1:3)

Insert 1 : priority 5 (2:2) (5:1)

Queues:

(1:3)

(2:2)

(5:1)

Display Heap/Queues – string nodes insert the: priority 1 Heap:

Insert Hunger: priority 5 (1:the)

Insert Games: priority 2 (5:Hunger) (2:Games)

Queues:

(1:the)

(2:Games)

(5:Hunger)

Insert/Enqueue node – int insert 3: priority 5 (5:3) is inserted in Heap!

(5:3) is enqueued in PriorityQueue!

(5:3) is inserted in PriorityHeapQueue!

**Reason for Test Case \_\_\_\_\_\_\_\_ Input Values\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_Expected Output**

Insert/Enqueue node – invalid int select insert integer, enter A A is not a valid number!

Insert/Enqueue node – int empty value select insert integer, is not a valid number!

enter without input

Insert/Enqueue node - string select insert string, (1:Hunger) is inserted in Heap!

enter Hunger : Priority 1 (1:Hunger) is enqueued in PriorityQueue!

(1:Hunger) is enqueued in PriorityHeapQueue!

Insert/Enqueue node – string empty value select insert string, is not a valid string!

enter without input

Remove/Dequeue node – empty Heap and Queues empty Removing root…

Heap is empty!

PriorityQueue is empty!

PriorityQueueHeap is empty!

Remove/Dequeue node – not empty Heap and Queues Removing root…

Have root (4:5) (4:5) is deleted from Heap!

(4:5) is dequeued from PriorityQueue!

(4:5) is dequeued from PriorityHeapQueueHeap!

Empty data select empty data Heap and Queues are emptied

Sort performance test select Sort performance test runs performance tests

**Reason for Test Case \_\_\_\_\_\_\_\_ Input Values\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_Expected Output**

New Heap/Queue type select new Heap/Queues type Heap and Queues are emptied

Program is restarted

Quit program select quit program Exits program

