PRIORITY QUEUE

- **What is a priority queue?**

  - Priority Queue is a type of queue with the following properties.
    1. Every item has a particular priority associated with it.
    2. An element with high priority is dequeued before an element with low priority.
    3. If two elements have the same priority, they are processed according to their order in the queue.

- **What are the operations associated with a priority queue?**
    1) Insert_element (data, priority)
       - This function inserts a new element in the queue.
    2) Get_Highest_Priority ()
       - The element with the highest priority will be returned.
    3) Delete_Highest_Priority ()
       - The element with the highest priority will be deleted.

- **How are priority queues implemented?**
  - Using Arrays
    - Insert_element() operation can be implemented by adding an item at end of array.

      Time complexity: O(1)

    - Get_Highest_Priority() operation can be implemented by linearly searching the highest priority item in array.

      Time complexity: O(n)

    - DeleteHighestPriority() operation can be implemented by first linearly searching an item, then removing the item by moving all subsequent items one position back.

      Time complexity: O(n)

  - Using Heap
    - Insert_element()

      Time complexity: O(log n)

    - Get_Highest_Priority()

      Time complexity: O(1)

    - DeleteHighestPriority()

      Time complexity: O(log n)