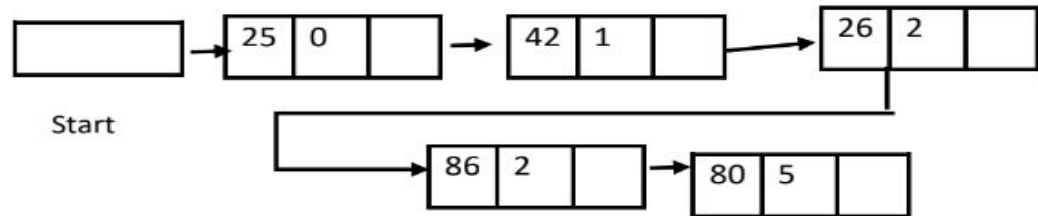# Priority Queue

By Er. Kushal Ghimire

Priority Queue

Priority Queue:

- Priority queue is an extension of queue with following properties:
  - Every item has a priority associated with it.
  - An element with high priority is dequeued before an element with low priority.
  - Two elements have the same priority, they are served according to their order in the queue.
- **Ascending Priority queue:**
  - An ascending priority queue is a collection of items into which items can be inserted arbitrarily and from which only the smallest items can be removed.
  - Lower priority number has higher priority.
  - For example: A queue may be viewed as ascending priority queue whose elements are ordered by the time of insertion. 0 has high priority

Item	Priority
25	0
80	5
26	2
42	1
86	2

Start → 25 0 → 42 1 → 26 2 →

→ 86 2 → 80 5

Priority Queue

- **Descending Priority Queue:**
    - A descending priority queue is similar but allows deletion of only the largest items.
    - Higher priority number to high priority
    - For example: A stack may be viewed as **descending priority** queue whose elements are ordered by the time of insertion. The element that was inserted last has the greatest insertion –time value and is the only that can be retrieved.

Item	Priority
25	0
80	5
26	2
42	1
86	2

Start
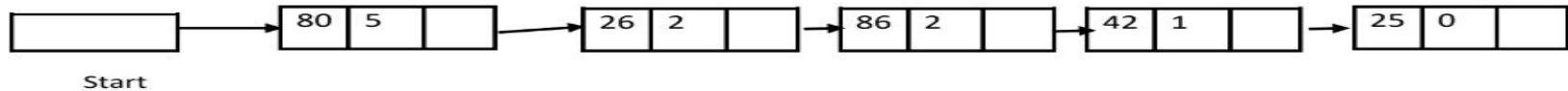
Application of Priority Queue:

- It is used in data compression techniques like Huffman code.
- Priority queues are used to select the next process to run.
- It is used in bandwidth management to prioritize the important data packet.
- Used in algorithms like Dijkstra's shortest path algorithm, heap sort algorithm, etc.