



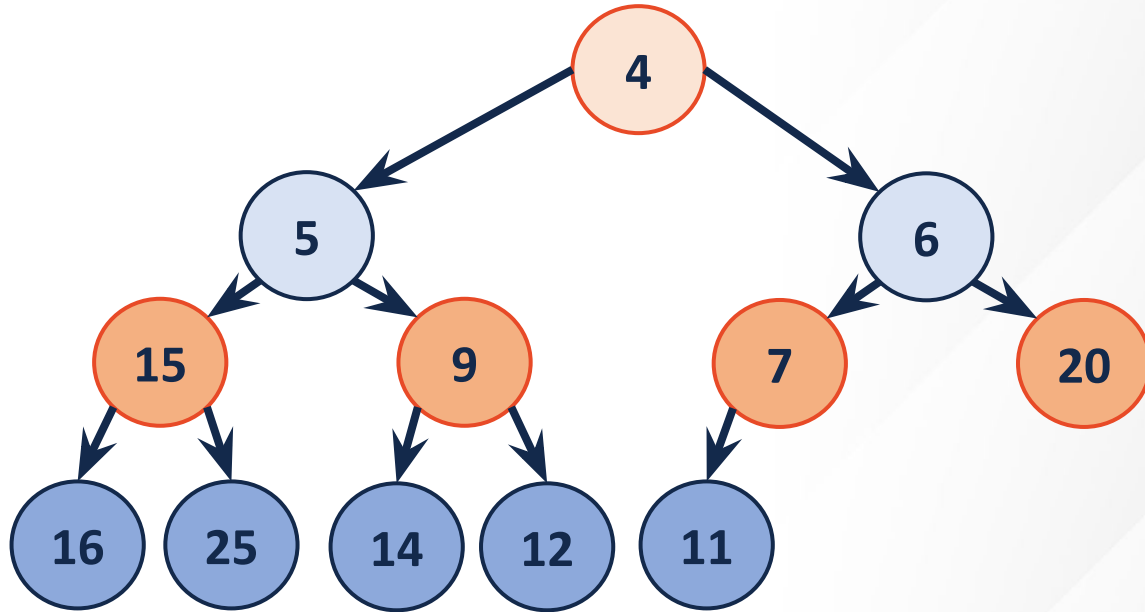
Heap Insert

Learning Objectives

1. Implement Insert in a Heap (HeapifyUp)
2. Know the runtime of Insert in a Heap



Min Heap Implementation



4	5	6	15	9	7	20	16	25	14	12	11			
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Insert Implementation

```
1  template <class T>
2  void Heap<T>::_insert(const T & key) {
3      // Check to ensure there's space to insert an element
4      // ...if not, grow the array
5      if ( size_ == capacity_ ) { _growArray(); }
6
7      // Insert the new element at the end of the array
8      item_[++size_] = key;
9
10     // Restore the heap property
11     _heapifyUp(size_);
12 }
```

HeapifyUp

```
1  template <class T>
2  void Heap<T>::_heapifyUp( _____ ) {
3      if ( index > _____ ) {
4          if ( item_[index] < item_[ parent(index) ] ) {
5              std::swap( item_[index], item_[ parent(index) ] );
6              _heapifyUp( _____ );
7          }
8      }
9  }
```