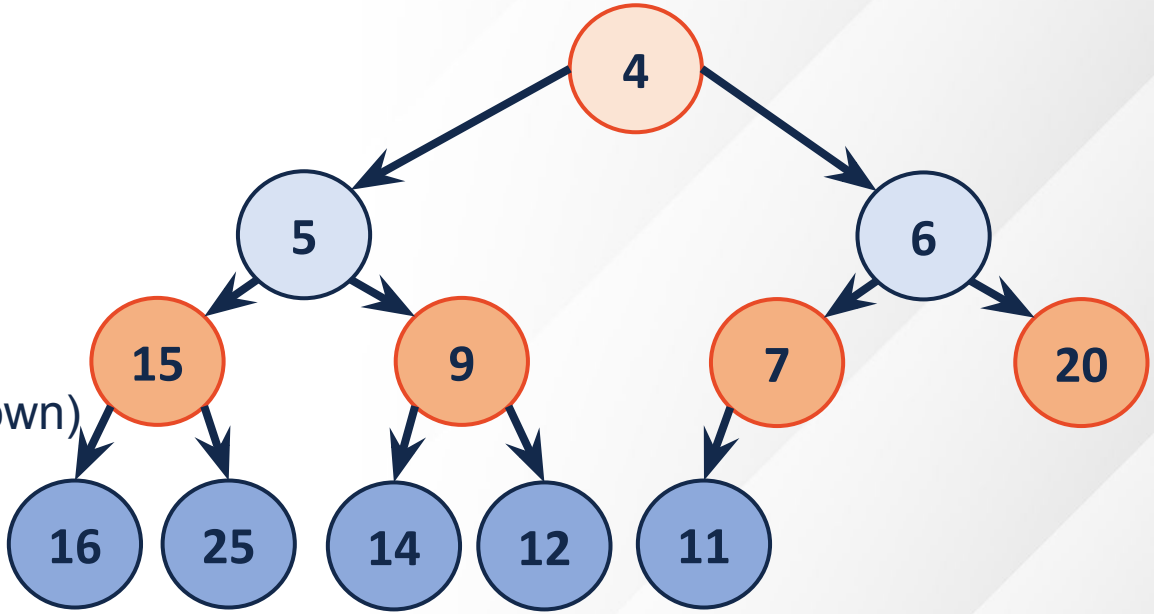
Build Heap

Learning Objectives

1. Review what a heap is
2. Understand the 3 different ways to build a heap

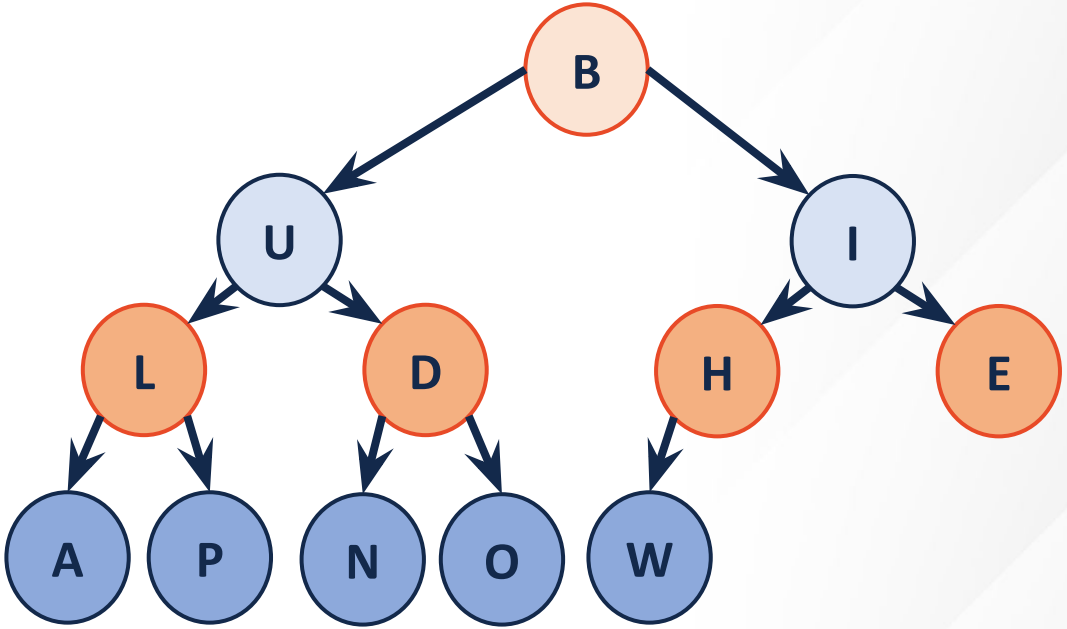
Min Heap Implementation

PriorityQueue
0 or 1 index
leftChild
rightChild
parent
Insert (HeapifyUp)
Remove (HeapifyDown)



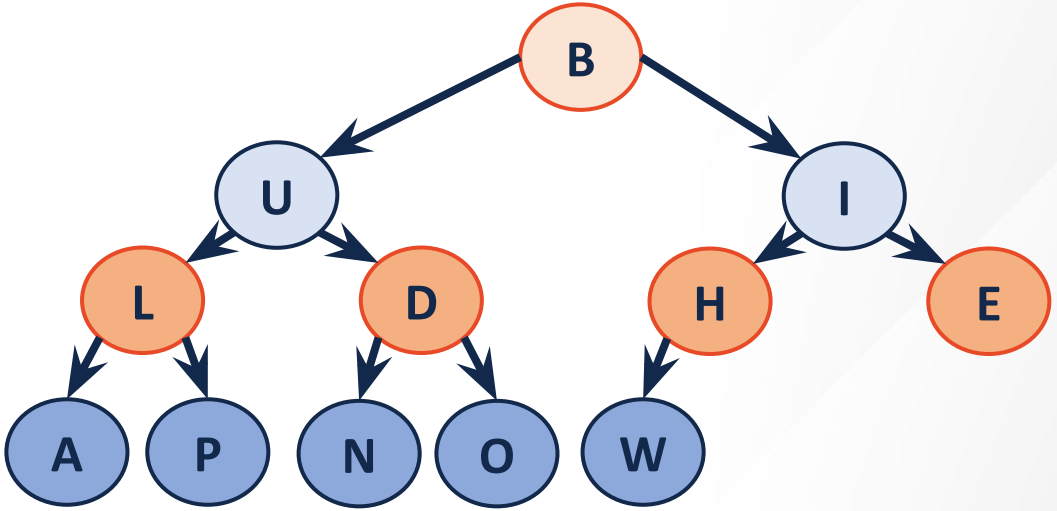
4	5	6	15	9	7	20	16	25	14	12	11			

BuildHeap



	B	U	I	L	D	H	E	A	P	N	O	W			

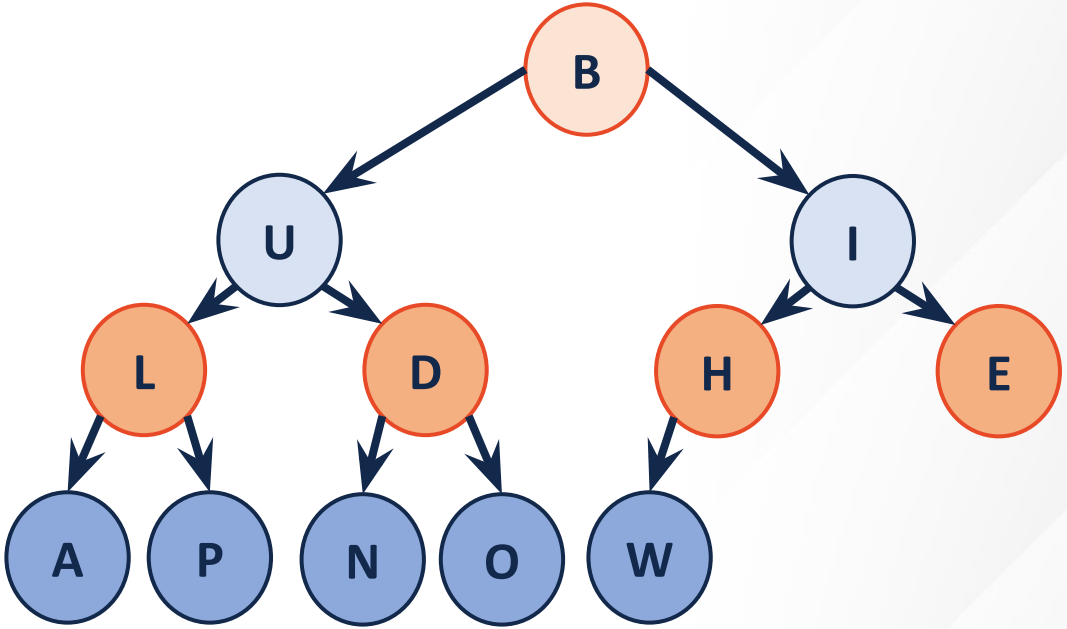
BuildHeap - Sort



	A	B	D	E	H	I	L	N	O	P	U	W			

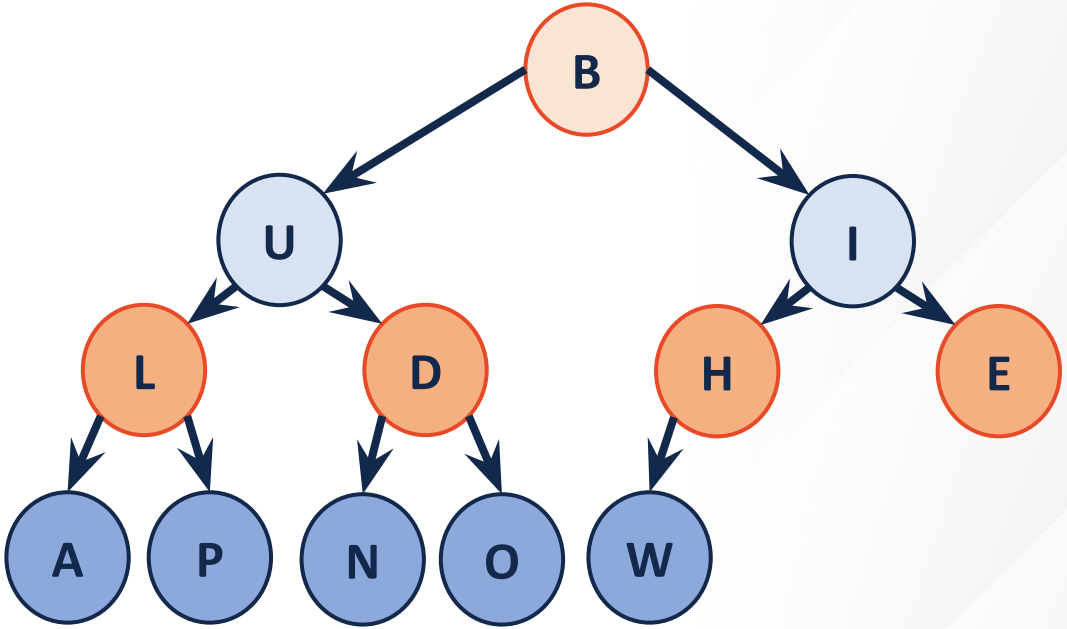
	B	U	I	L	D	H	E	A	P	N	O	W			

BuildHeap - HeapifyUp



	B	U	I	L	D	H	E	A	P	N	O	W			

BuildHeap - HeapifyDown



	B	U	I	L	D	H	E	A	P	N	O	W			

Build Heap

```
1  template <class T>
2  void Heap<T>::buildHeap() {
3    for (unsigned i = 2; i <= size_; i++) {
4      heapifyUp(i);
5    }
6  }
```

```
1  template <class T>
2  void Heap<T>::buildHeap() {
3    for (unsigned i = parent(size); i > 0; i--) {
4      heapifyDown(i);
5    }
6  }
```