Data Structures
Sorting Technique – Heap Sort

Team Emertxe

Dependency Algorithm

Introduction

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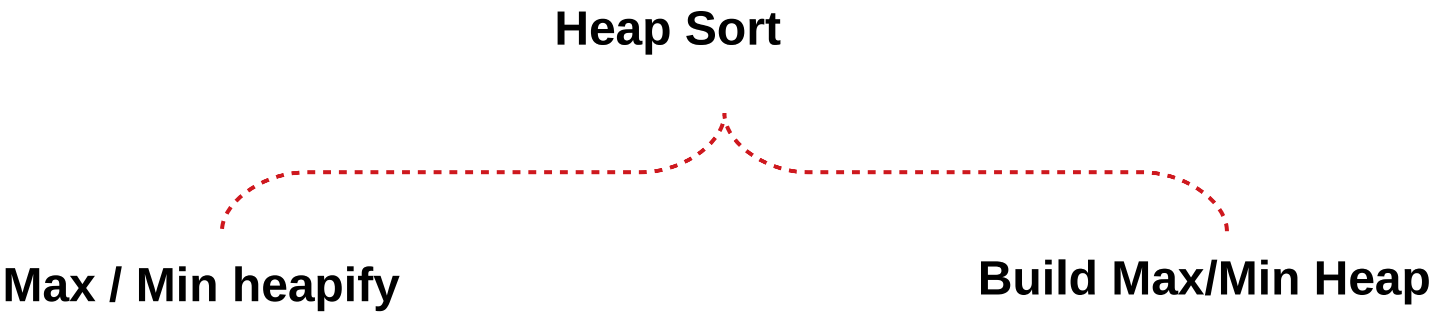

Heap Sort

Max / Min heapify

Build Max/Min Heap

Max heapify

Introduction

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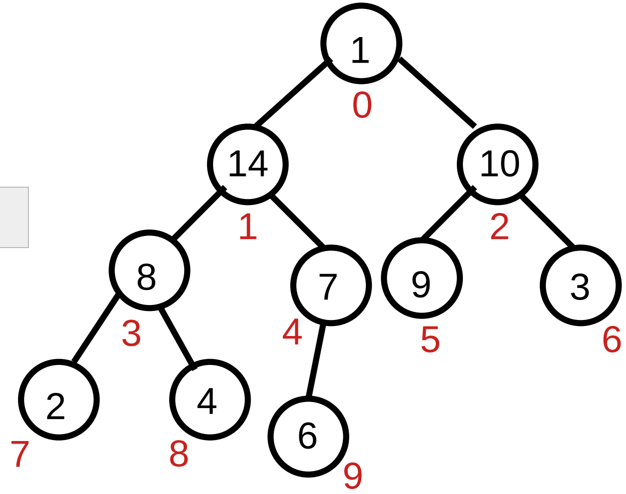

Algorithm

maxheapify(arr,index,size):

Input Specification:

arr	:	Array to hold elements
Index	:	Integer value
size	:	Length of the array

maxheapify(arr,index,size)

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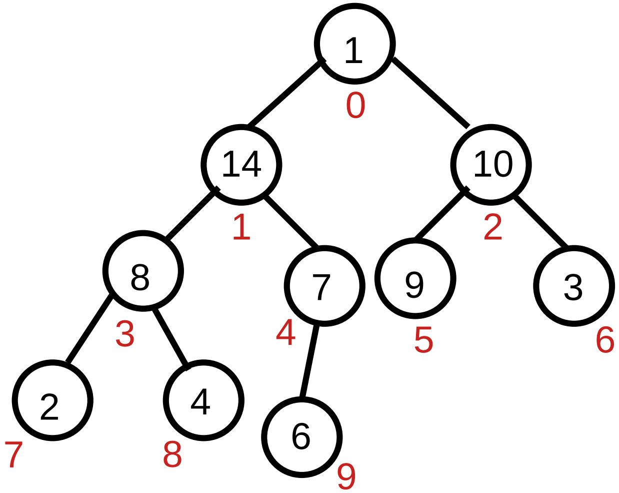

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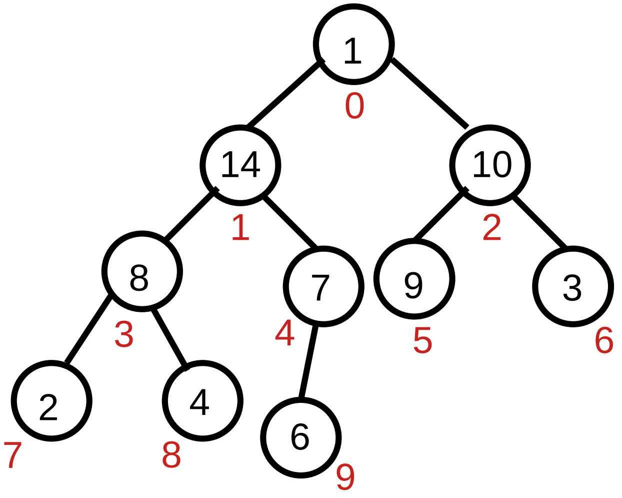

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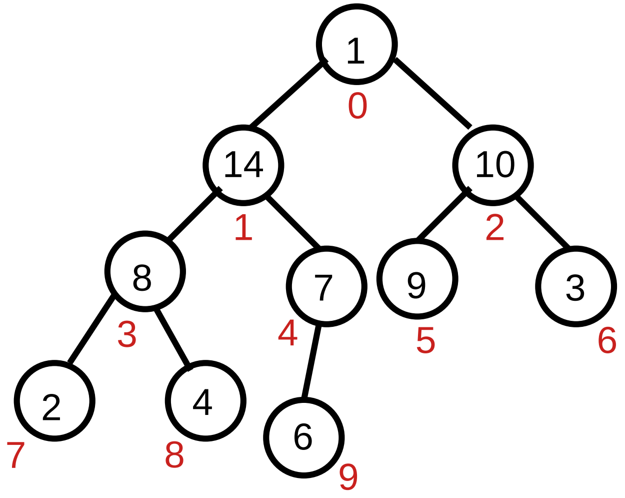

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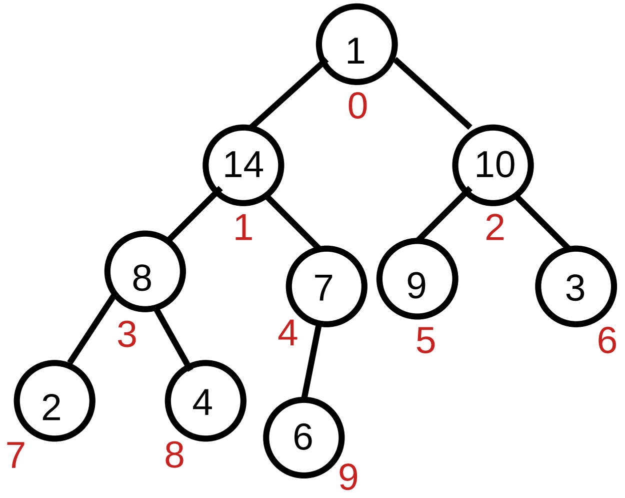

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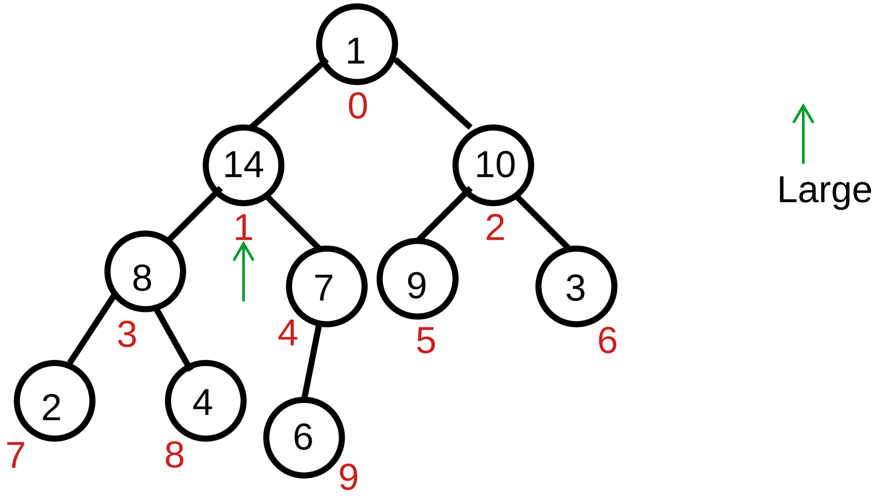

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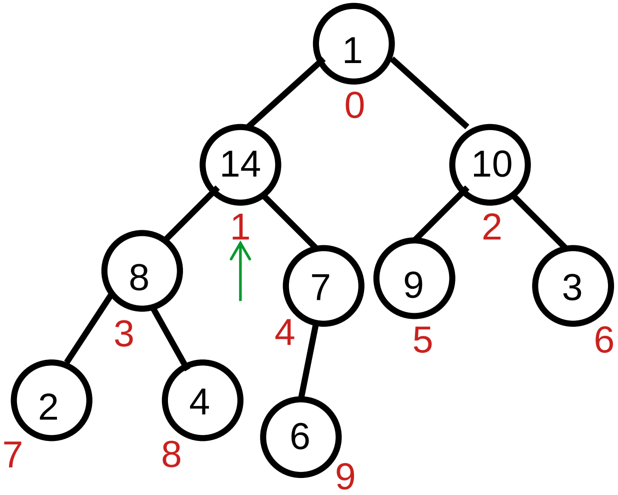

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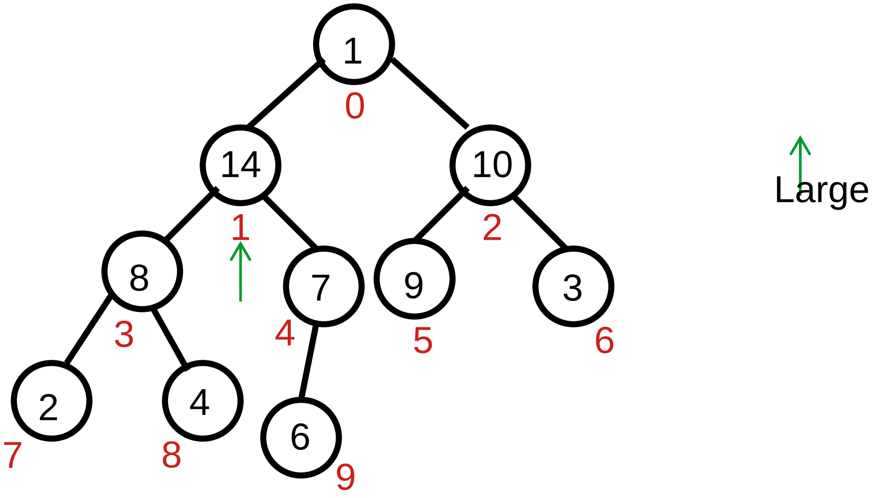

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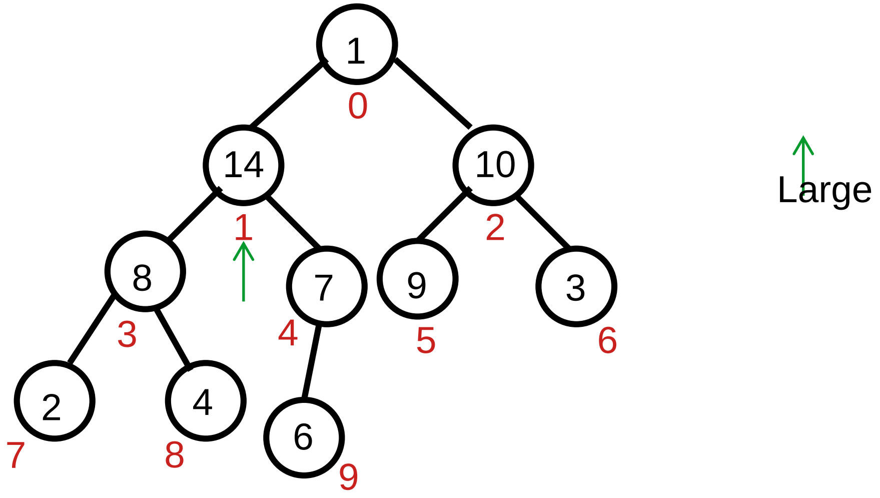

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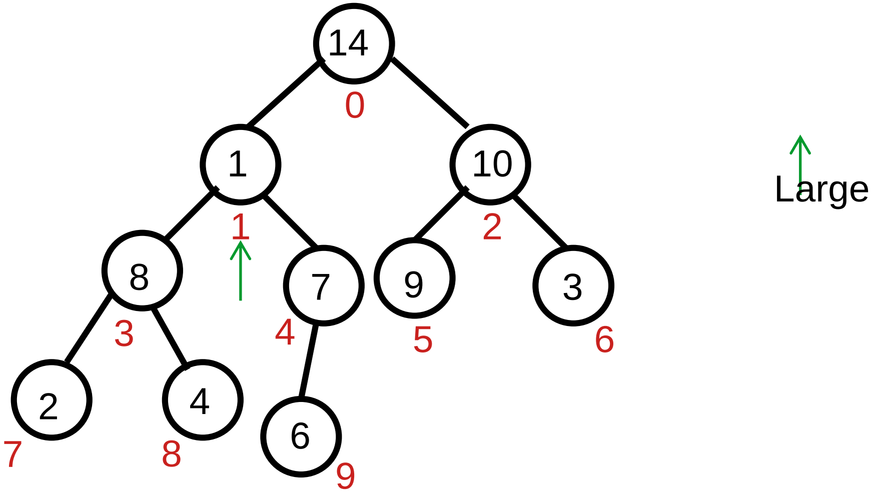

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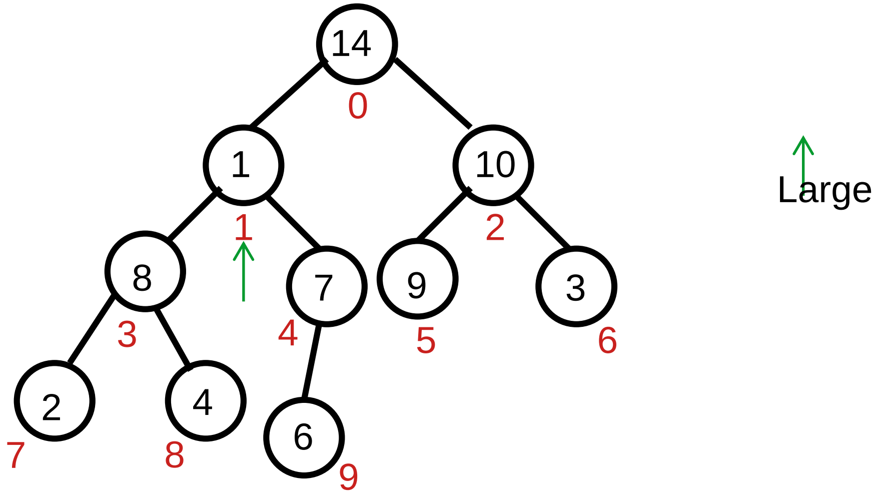

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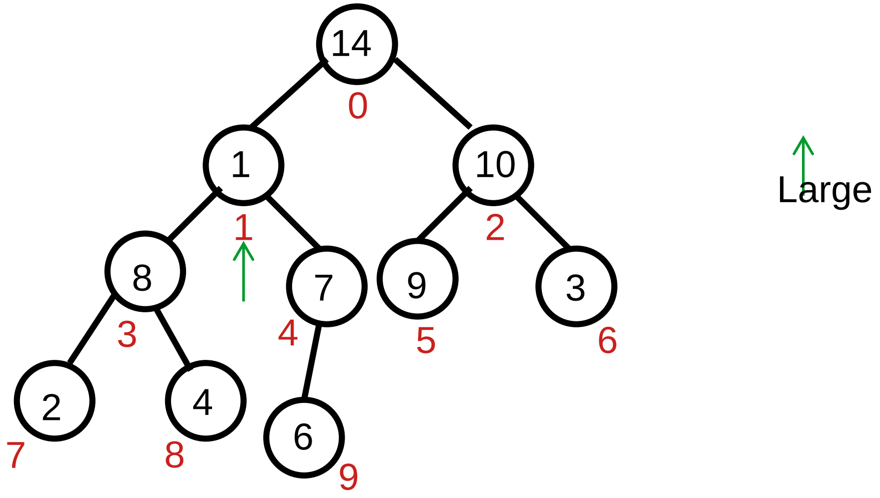

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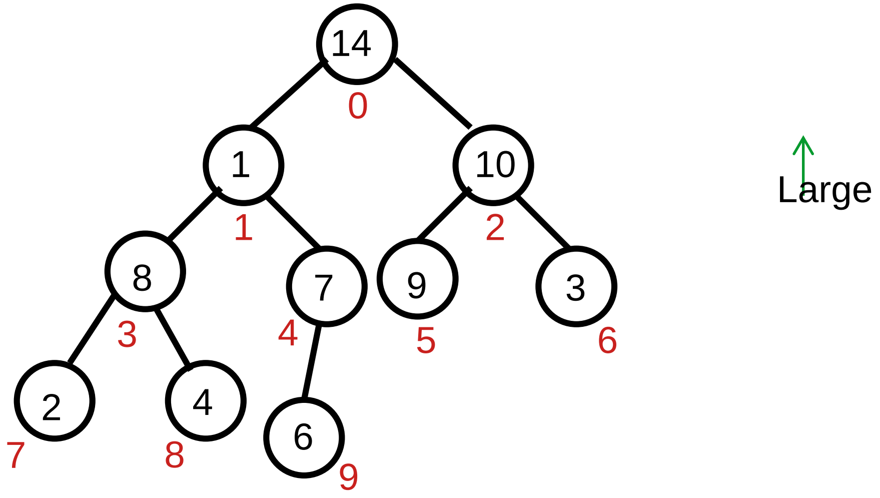

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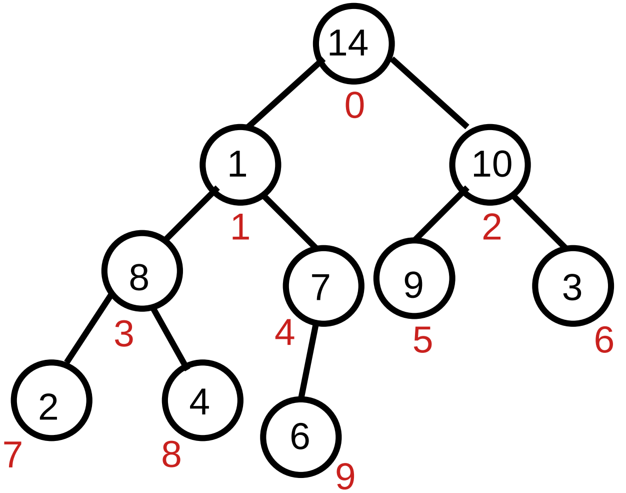

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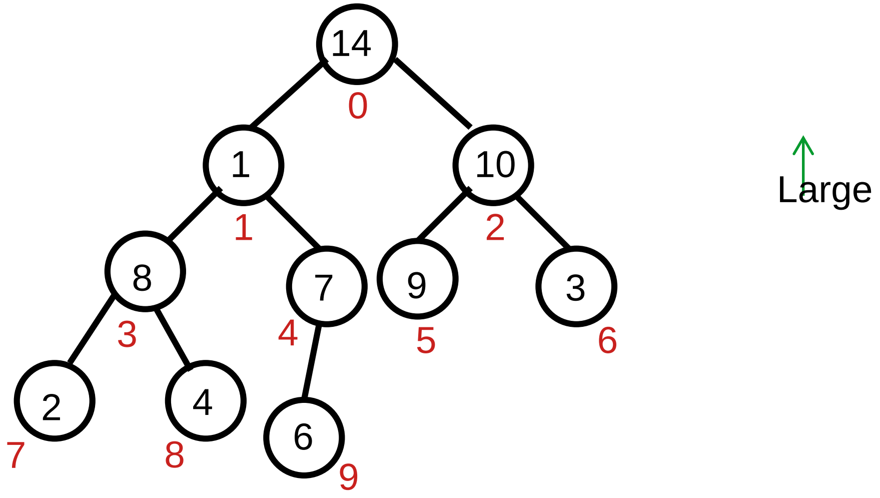

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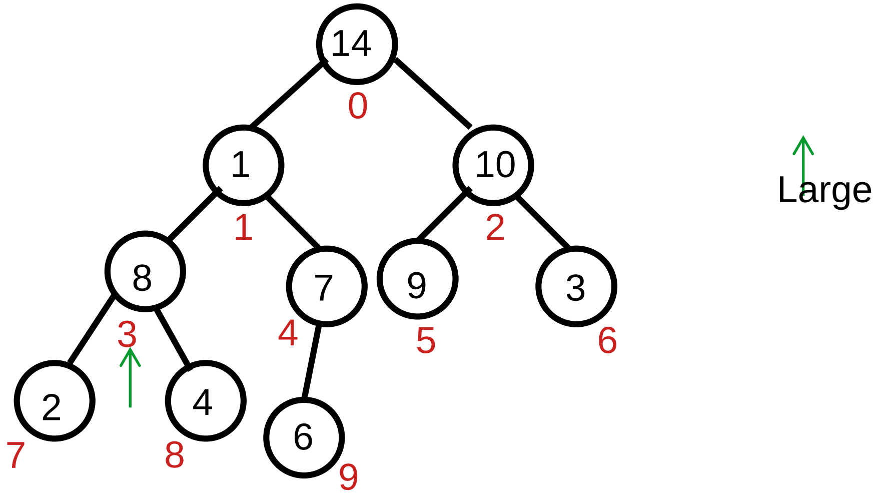

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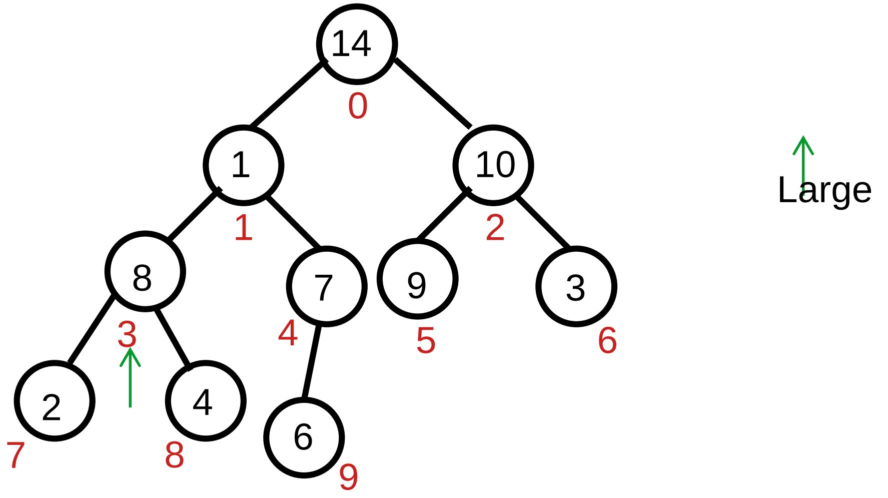

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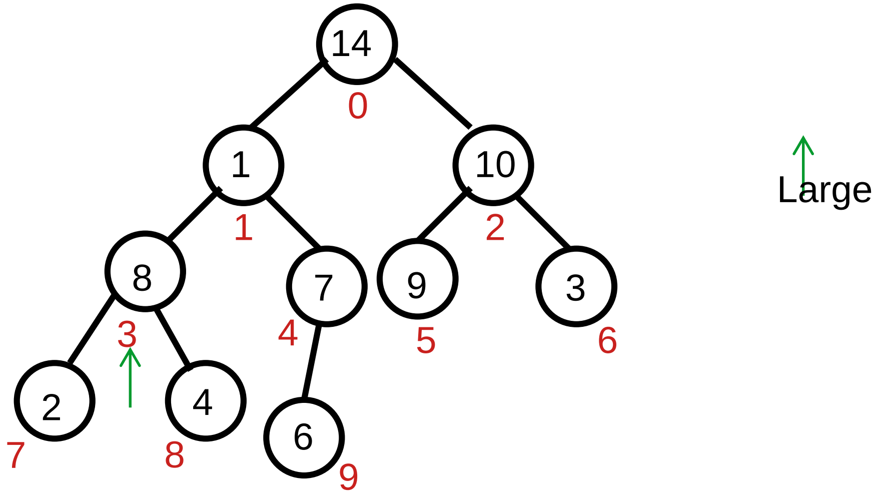

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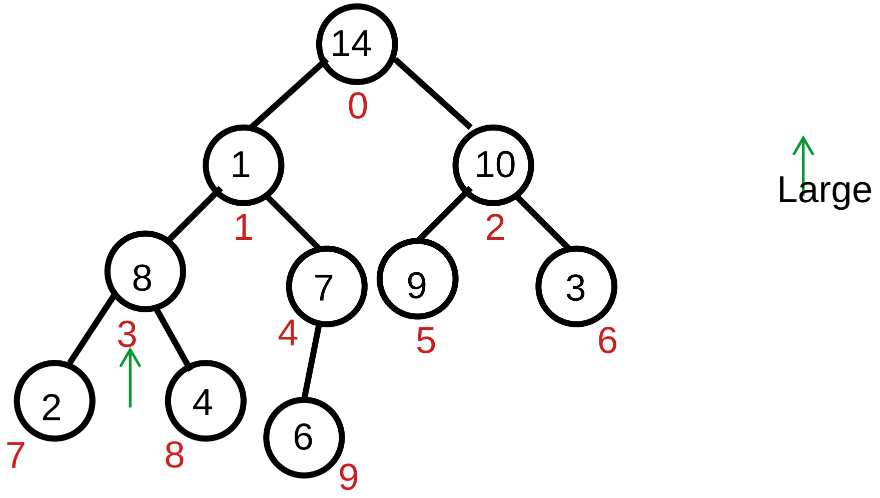

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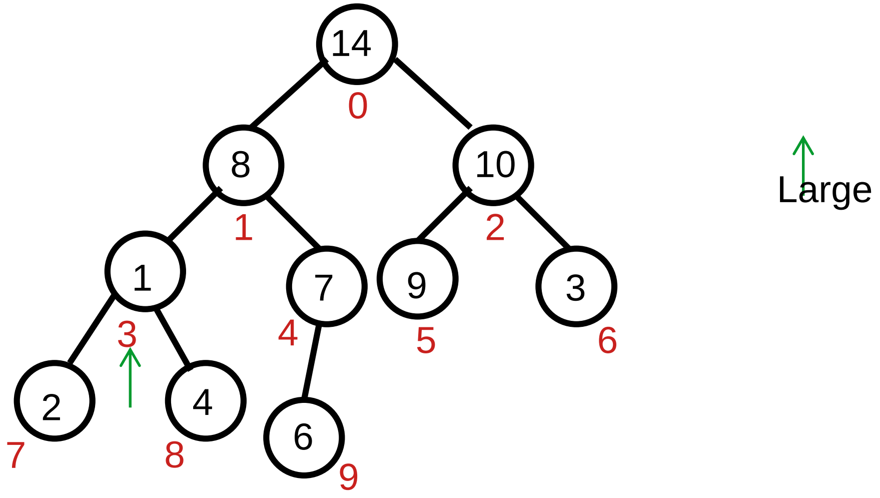

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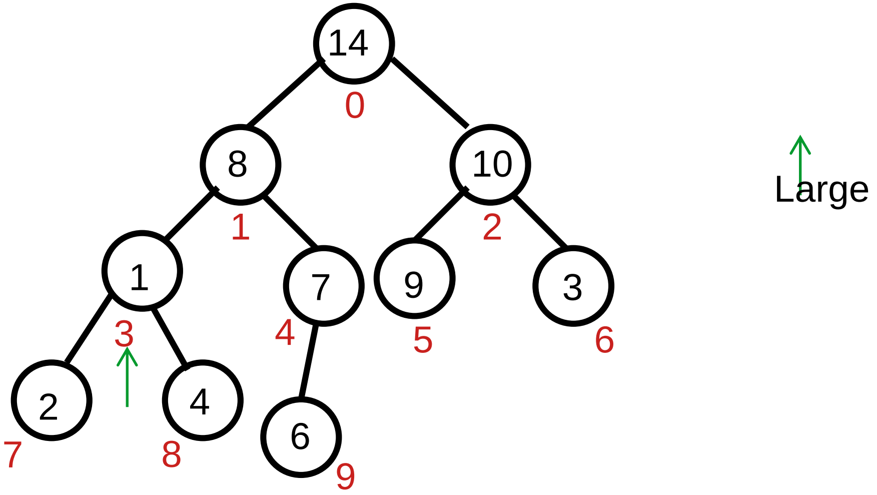

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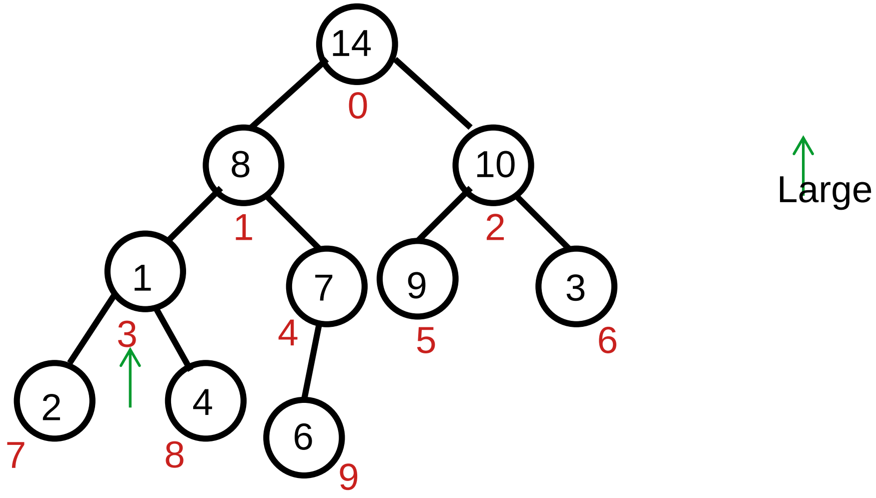

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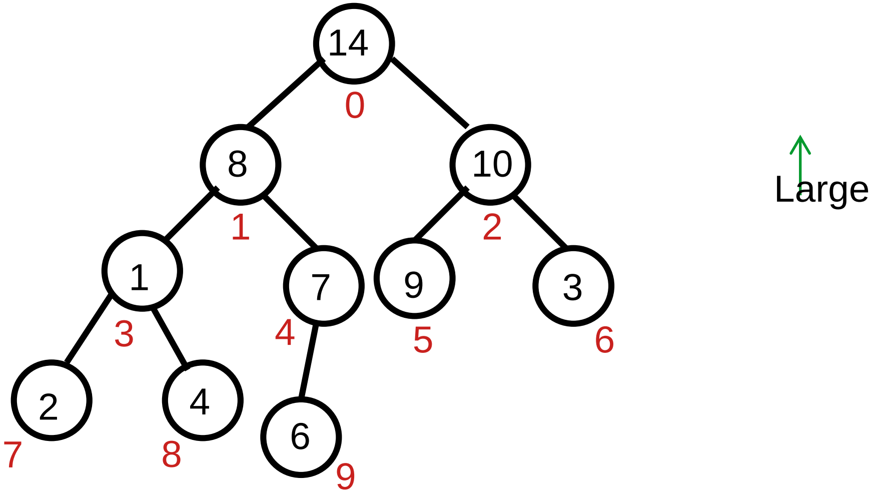

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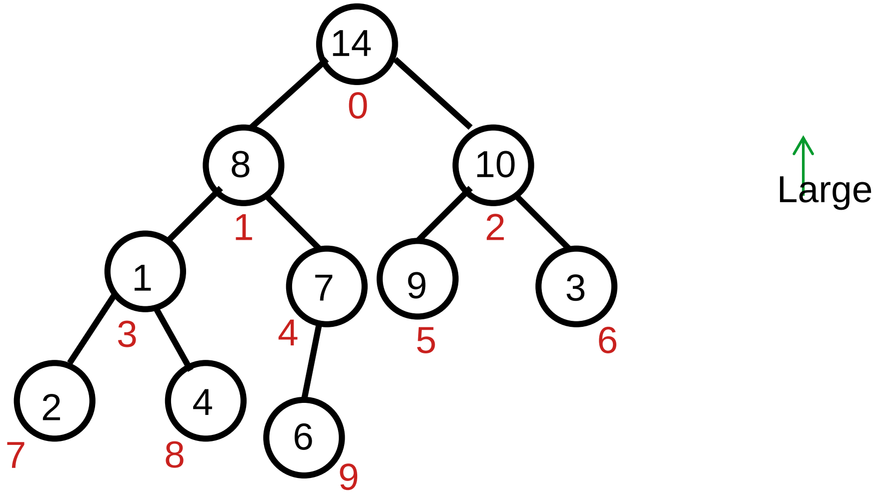

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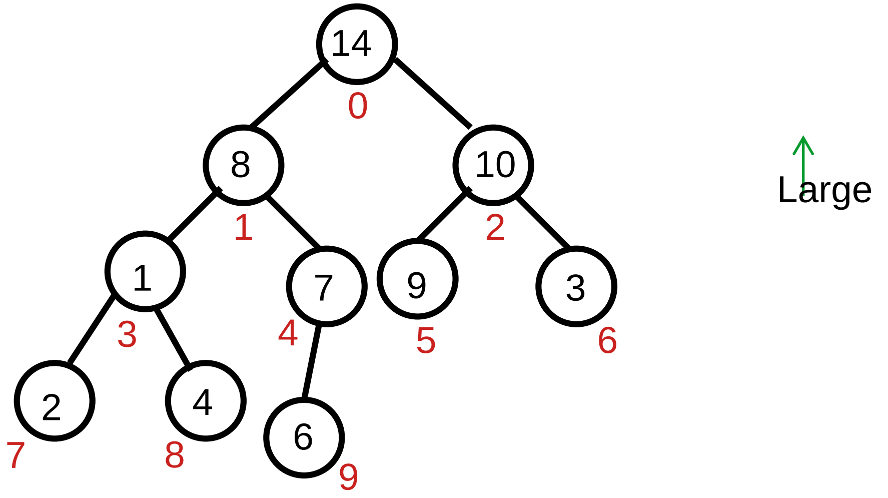

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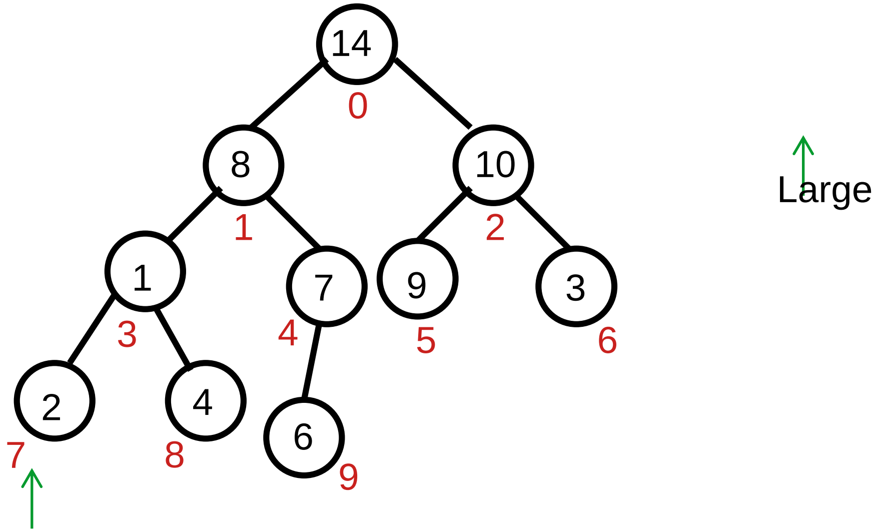

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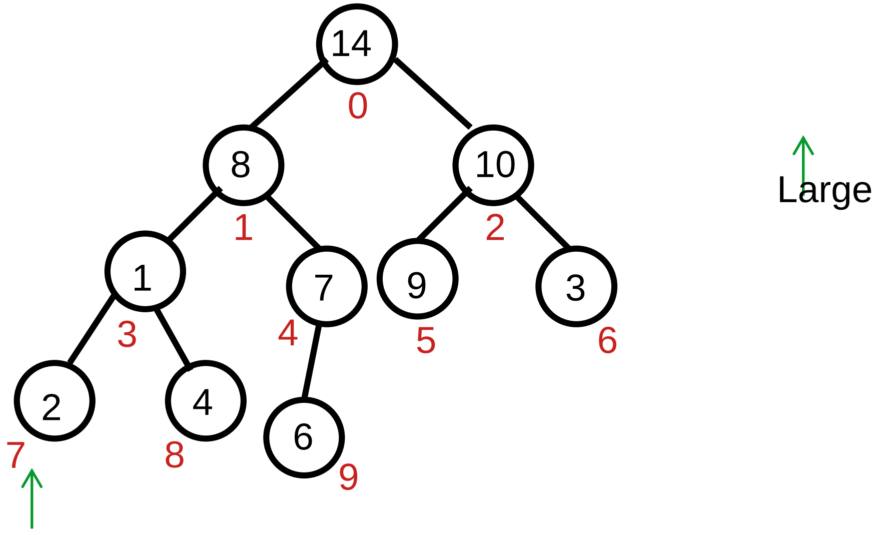

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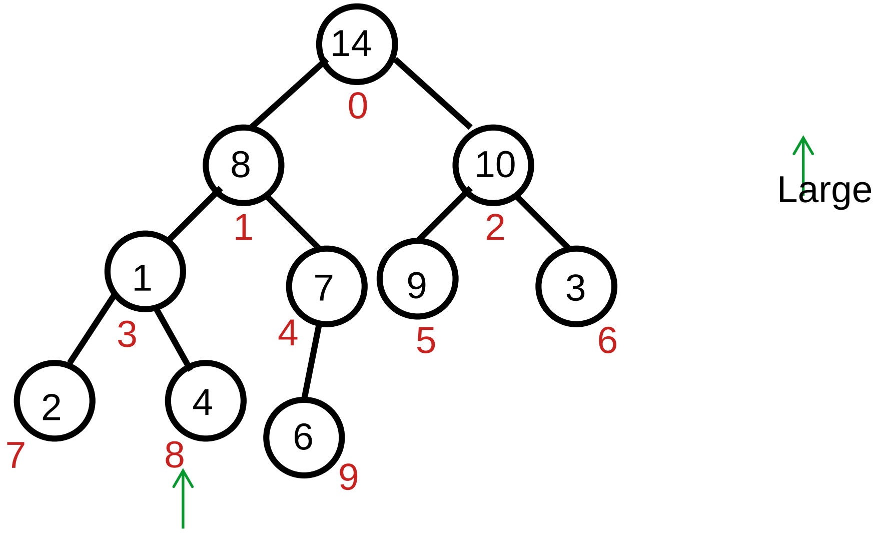

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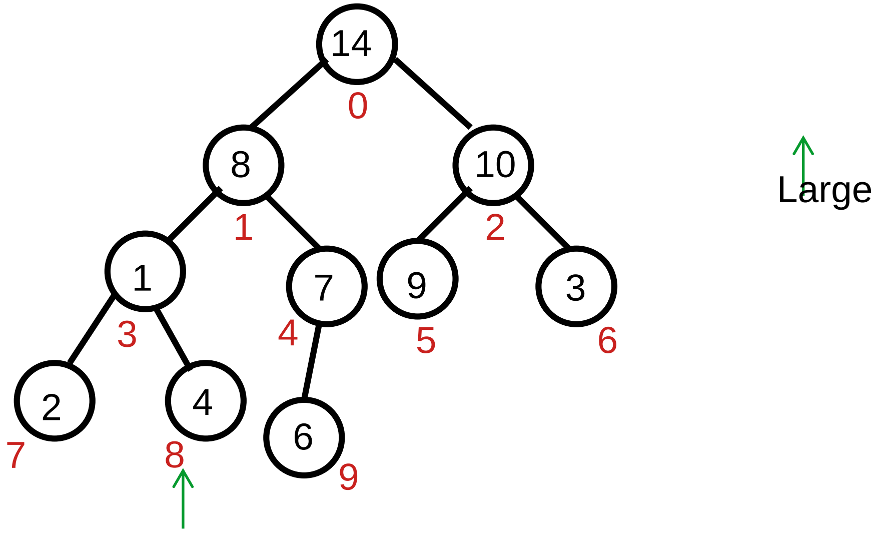

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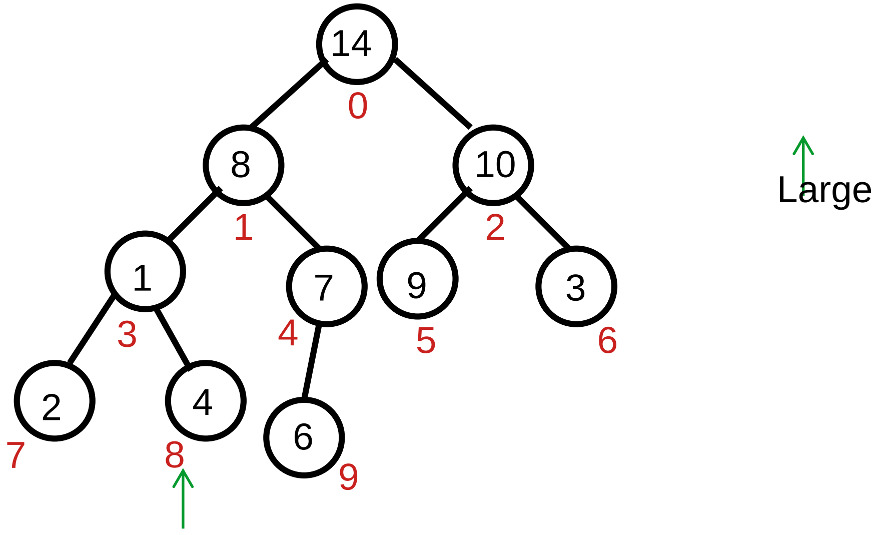

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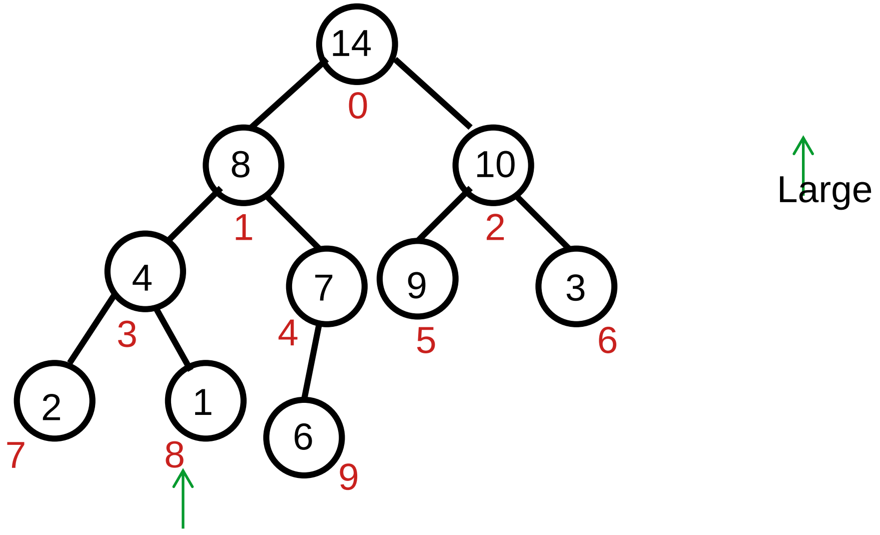
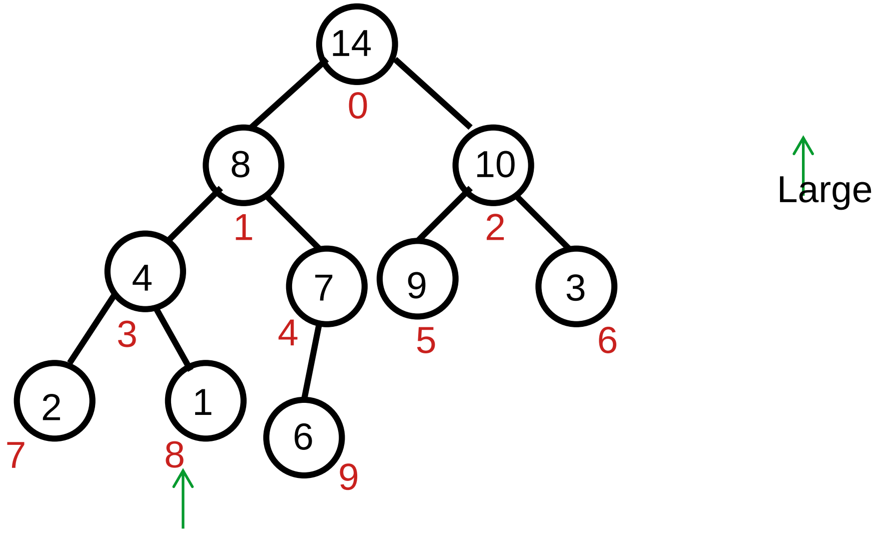


maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 3 L = 7 R = 8

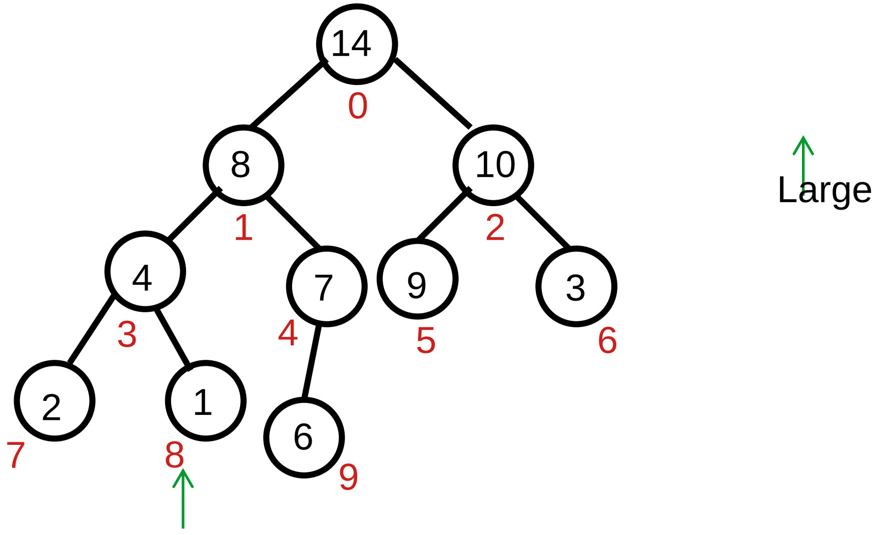


maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8



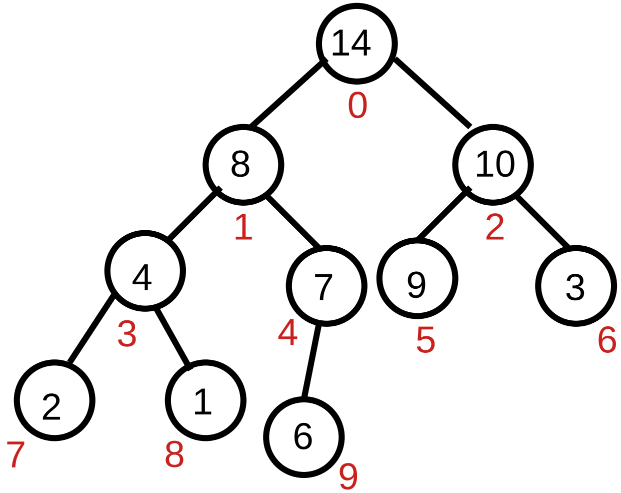
maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8

L = 17



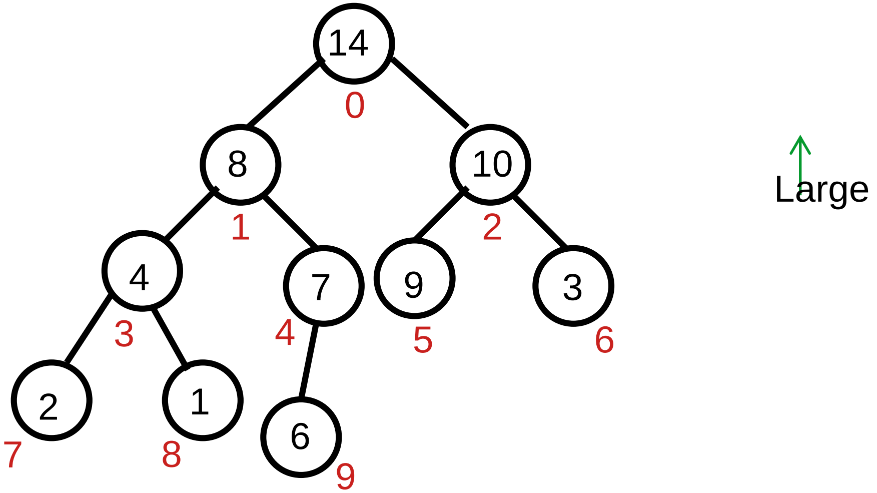
Large

maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8 L = 17 R = 18



maxheapify(arr,index,size)

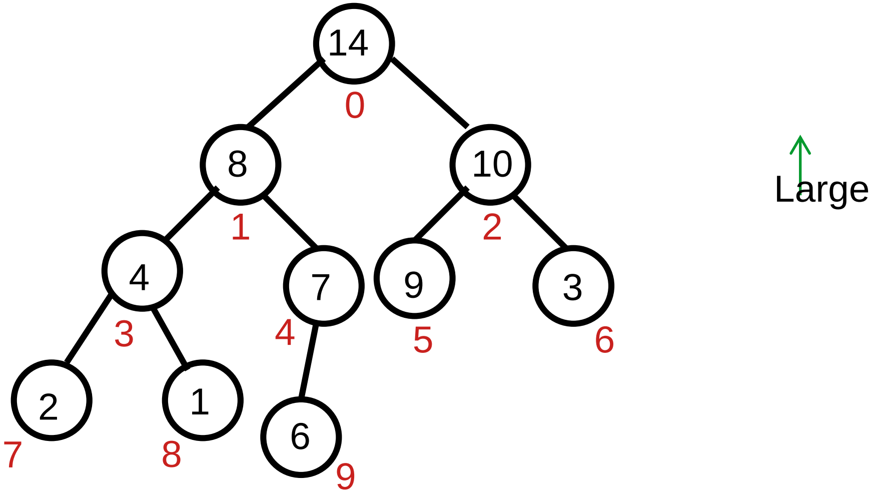
SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8

L = 17

R = 18

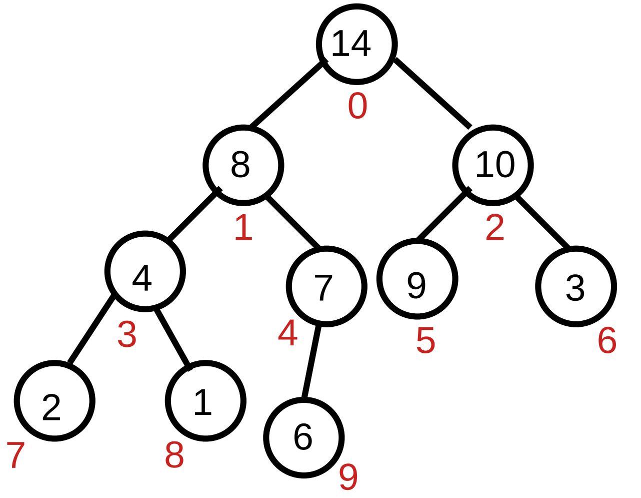


maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8 L = 17 R = 18



Large

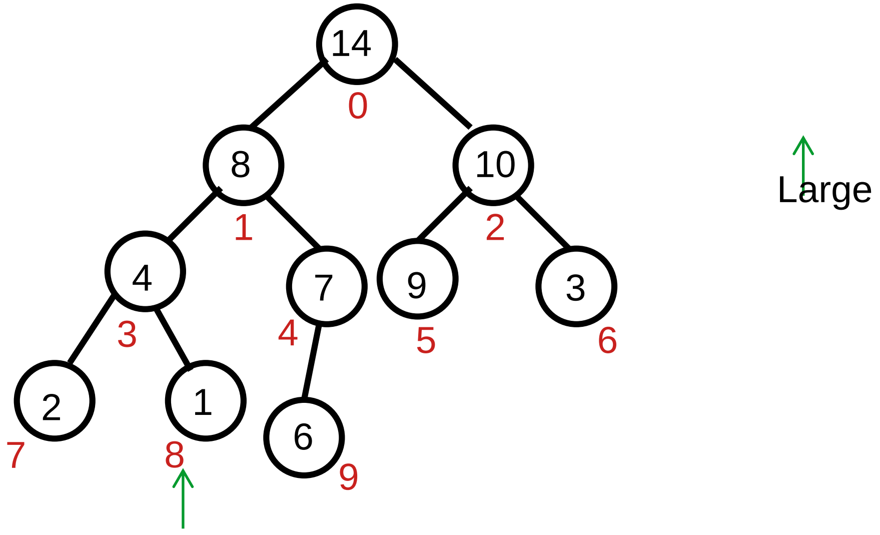
Data Structure – Sorting Techniques

maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8 L = 17 R = 18

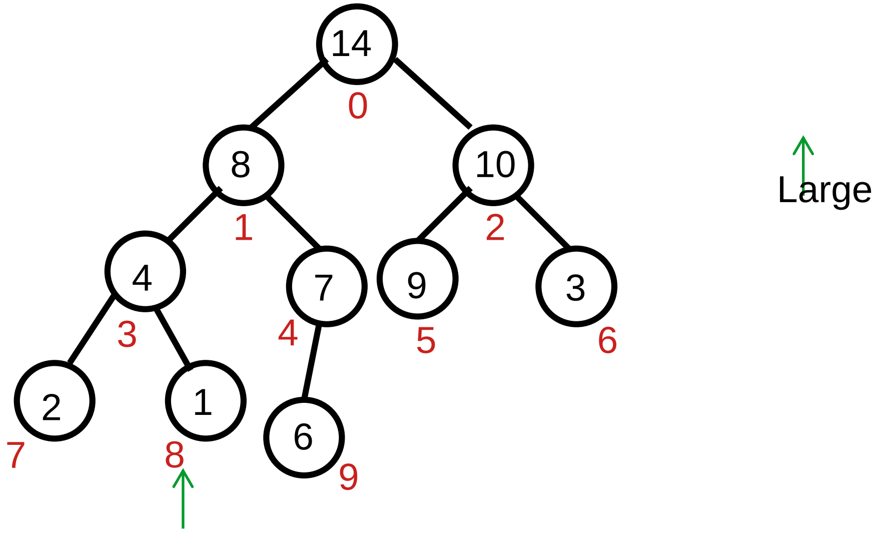


maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

index = 8   L = 17   R = 18



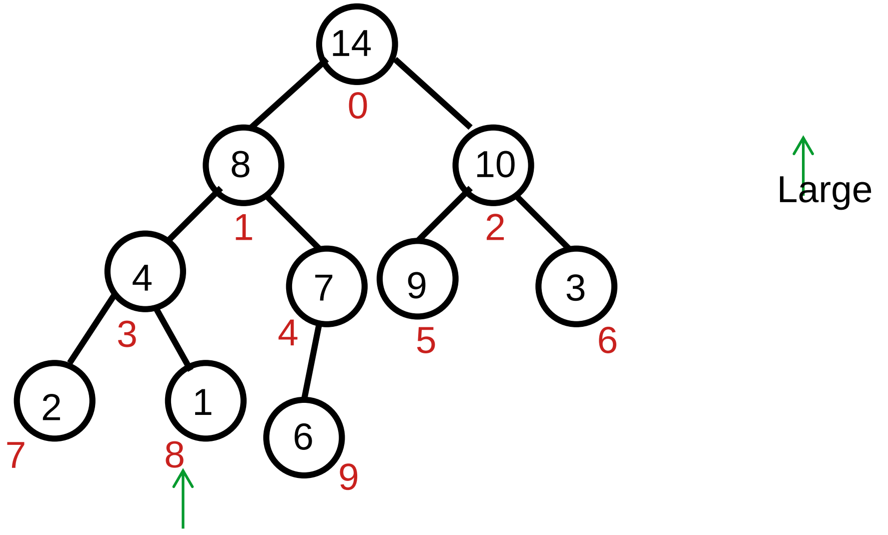
Data Structure – Sorting Techniques

maxheapify(arr,index,size)

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```

SIZE = 10

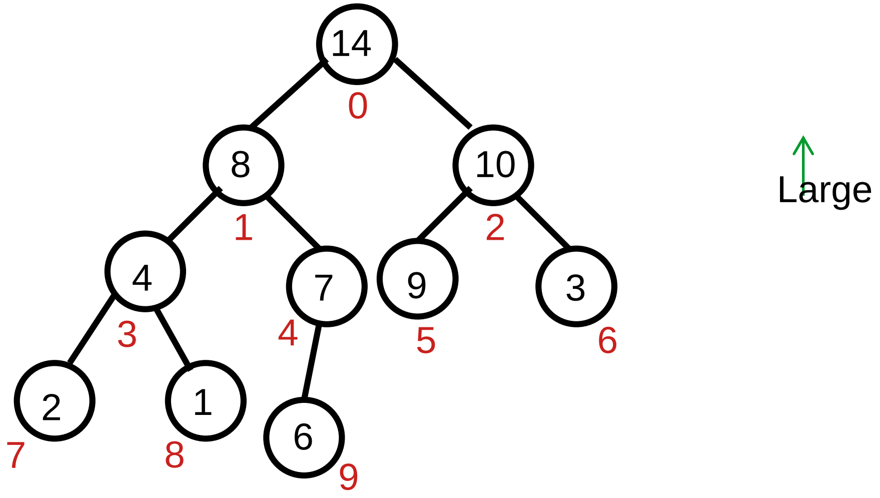
index = 8 L = 17 R = 18



maxheapify(arr,index,size)

SIZE = 10

```
L = 2*index +1
R = 2*index+2
if(L < size AND arr[index] < arr[L])
  large = L
else
  large = index
if(R < size AND arr[large]< arr[R])
  large = R
if(index != large)
  swap(arr[large] ,arr[index])
  maxheapify(arr,large,size)
```



Build Maxheap