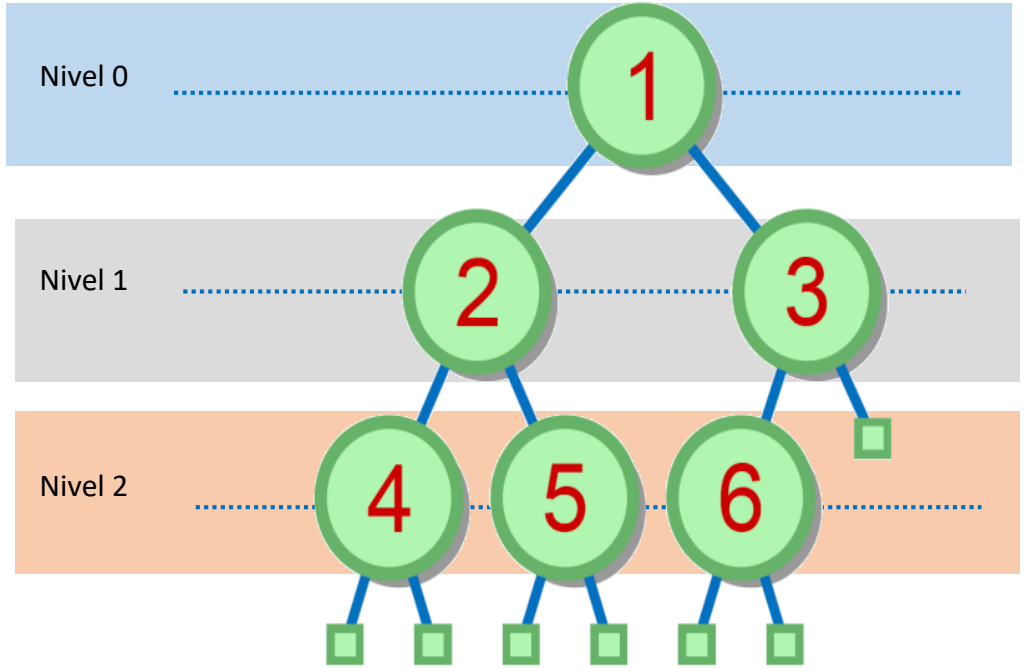
Ejercicios de árboles binarios

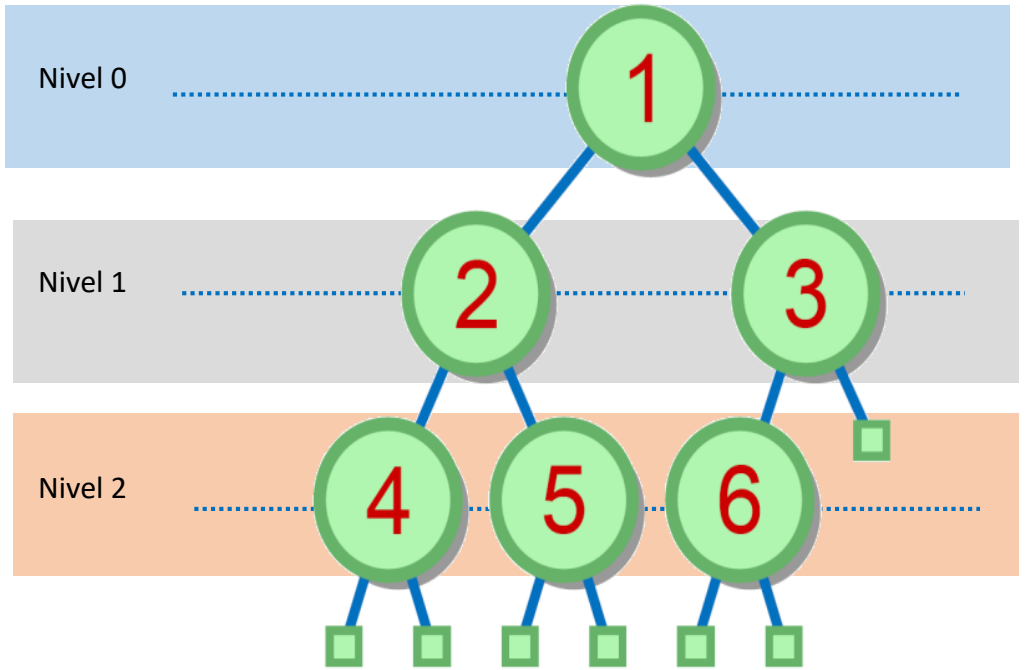
Niveles y Altura de un árbol

Los **niveles** de un árbol se numeran desde **cero**, comenzando por la **raíz**

La **altura** de un árbol es el número de niveles

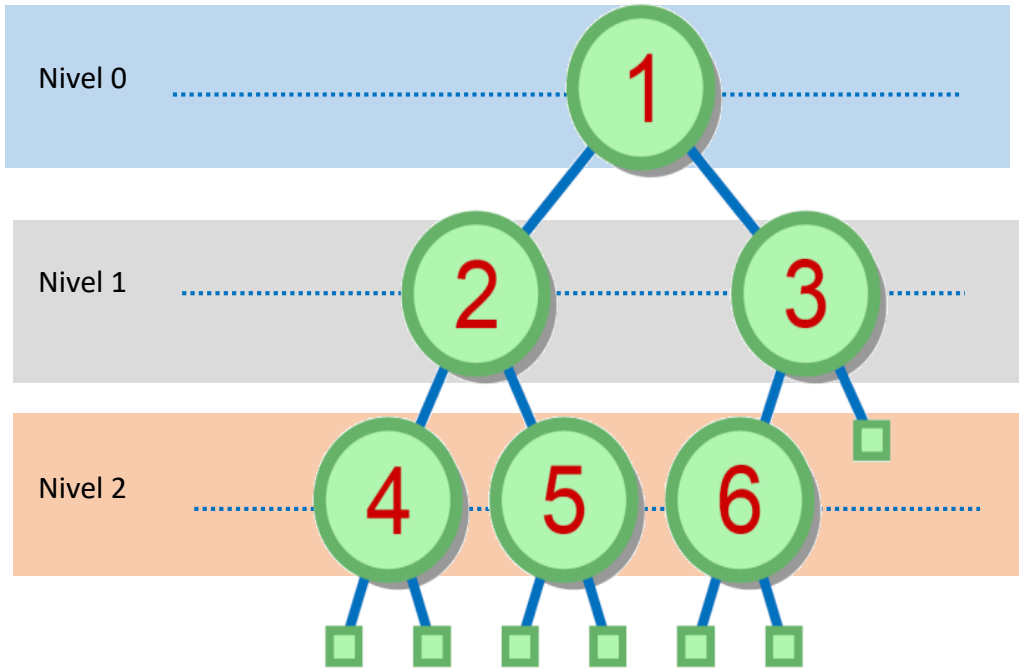


Suma de un árbol – suma de sus nodos



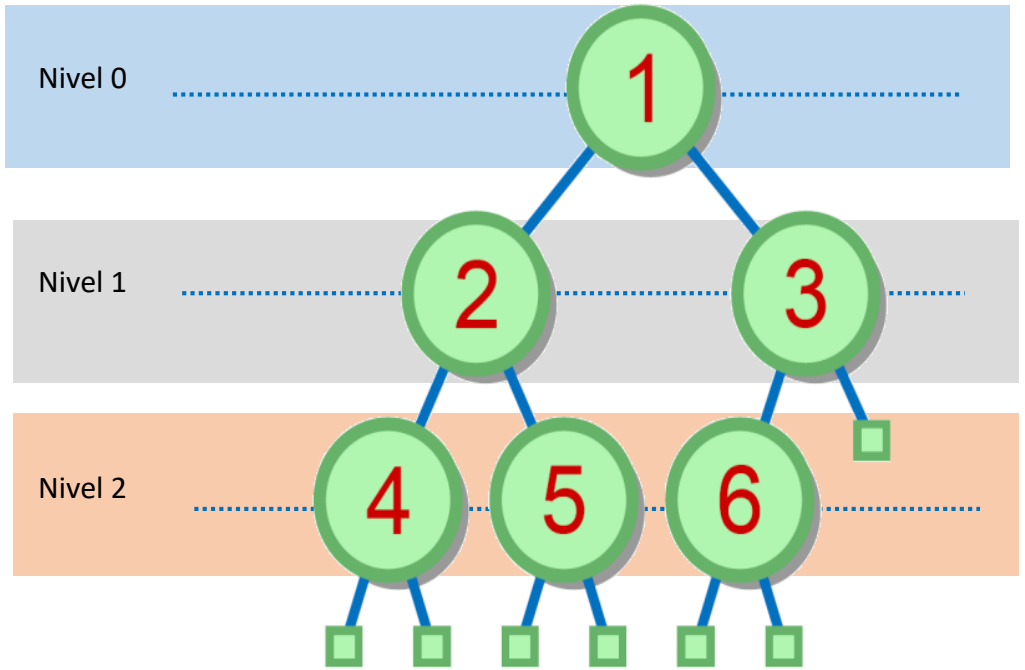

```
Main> sumB tree2
21
```

Peso de un árbol – número de nodos



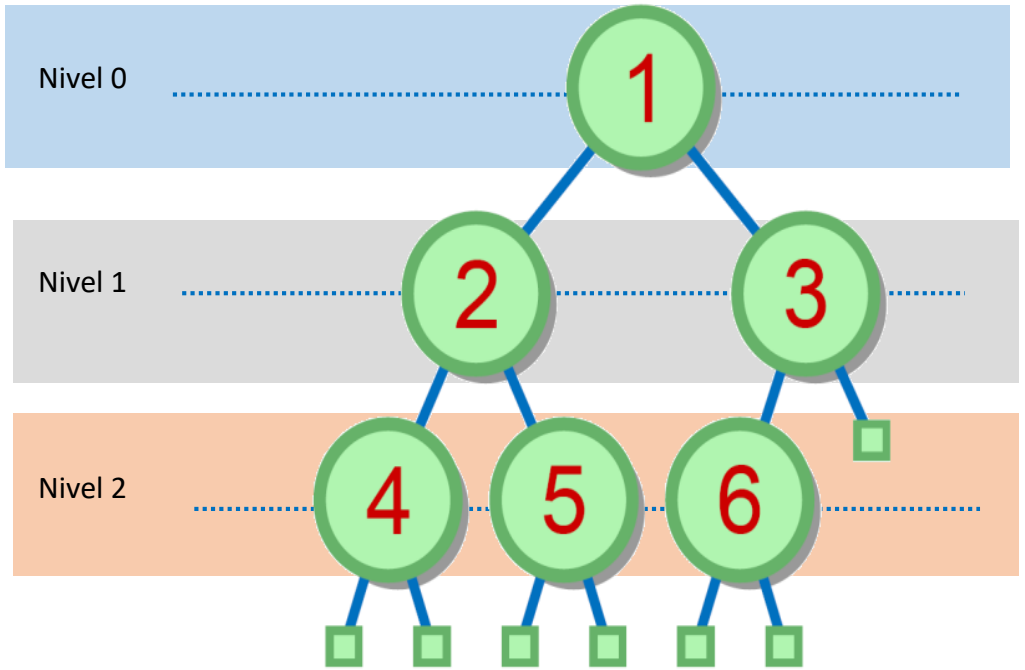

```
Main> weightB tree2
6
```

Altura de un árbol – número de niveles



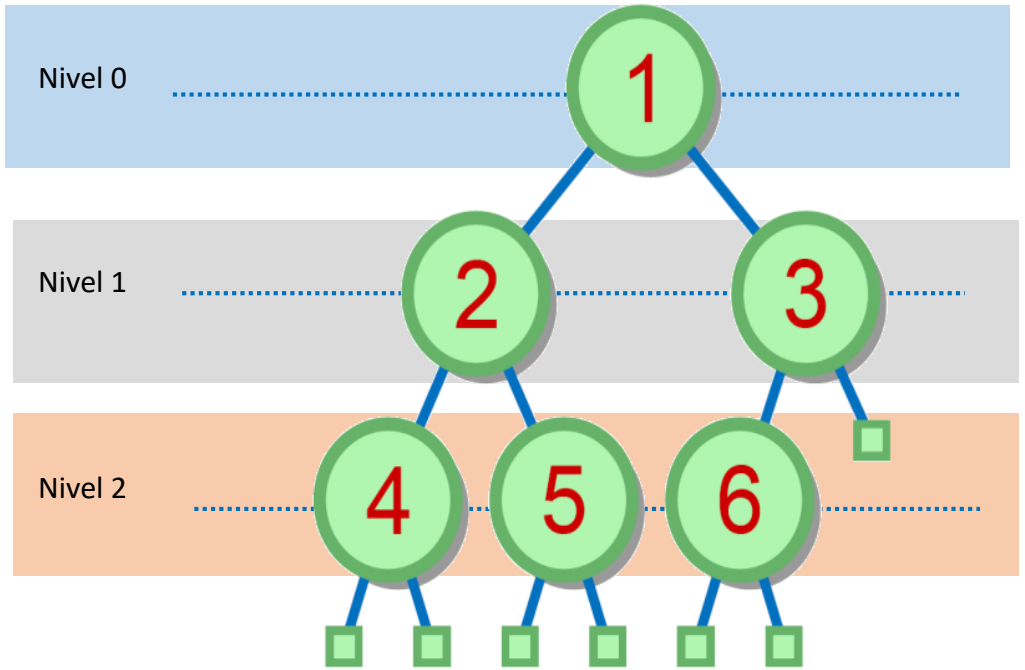

```
Main> heightB tree2
3
```

Frontera de un árbol – colección de nodos hoja



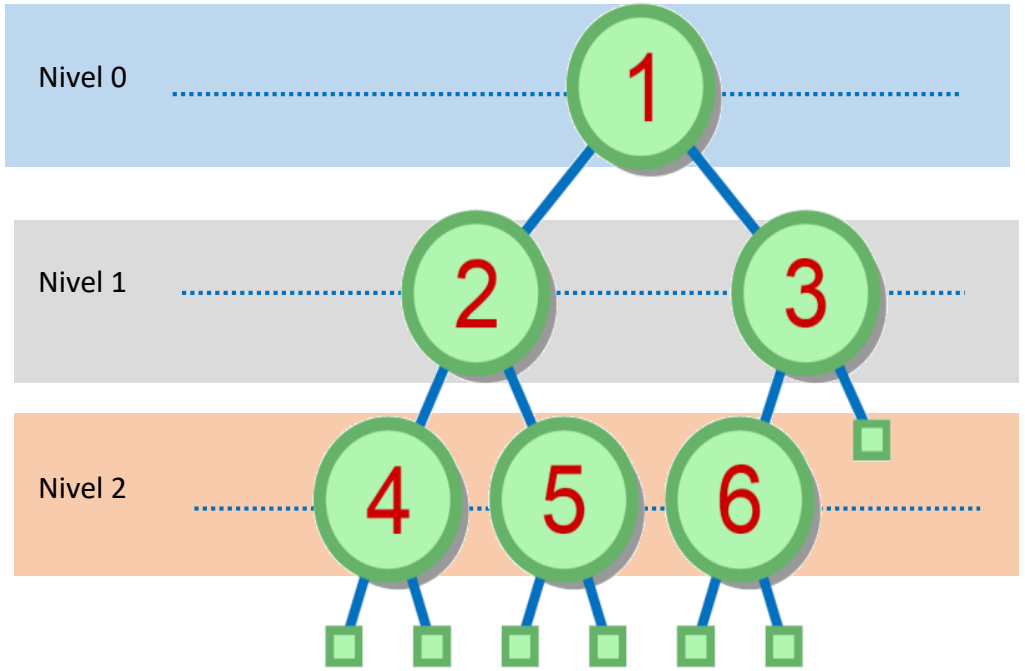

```
Main> borderB tree2
[4,5,6]
```

isElem x t – comprobar si un nodo pertenece a un árbol



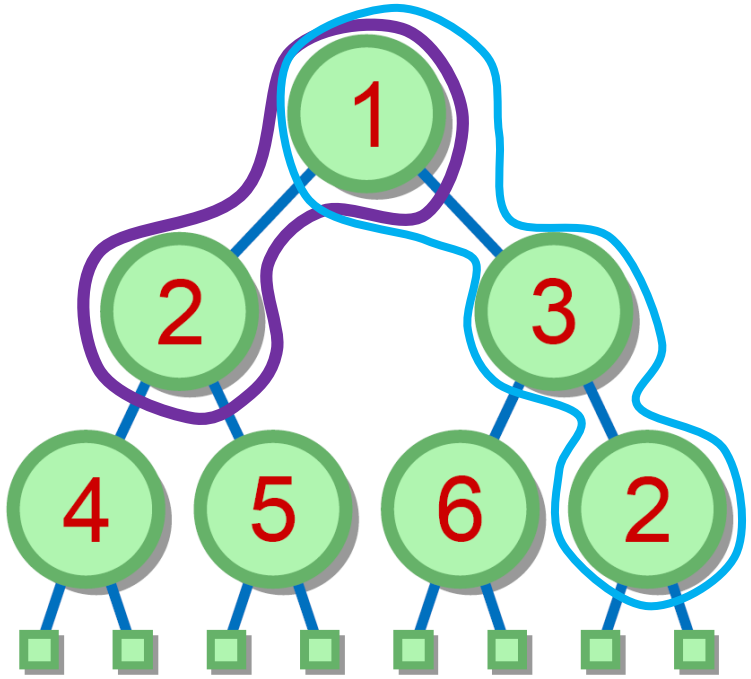

```
Main> isElemB 3 tree2
True
Main> isElemB 30 tree2
False
```

atLevel i t – nodos en el nivel i del árbol t




```
Main> atLevelB 0 tree2
[1]
Main> atLevelB 1 tree2
[2,3]
Main> atLevelB 2 tree2
[4,5,6]
Main> atLevelB 3 tree2
[]
```

pathsTo x t – caminos hasta el nodo x en el árbol t



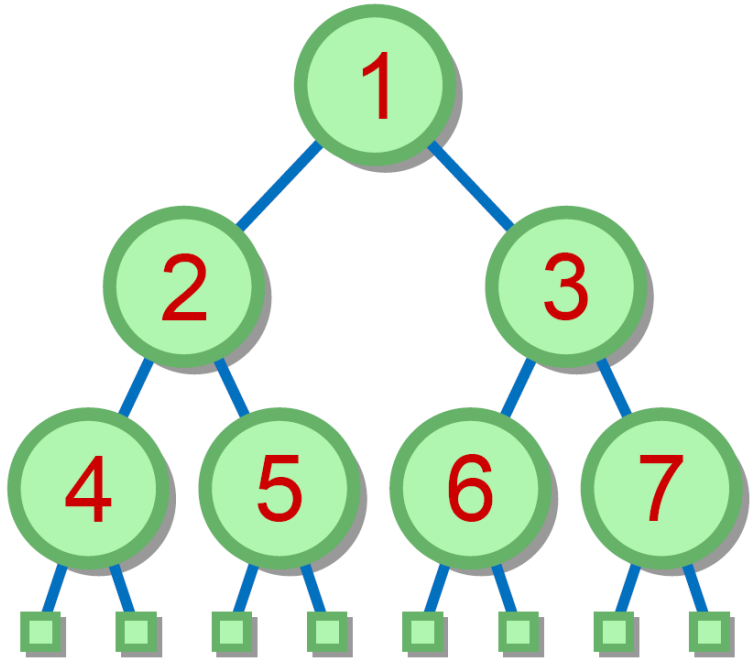

```
Main> pathsToB 5 tree3
[[1,2,5]]
Main> pathsToB 2 tree3
[ [1,2] , [1,3,2] ]
Main> pathsToB 9 tree3
[]
```

Recorrido de Árboles Binarios

Preorden = Raíz + Izquierda + Derecha

Inorden = Izquierda + Raíz + Derecha

PostOrden = Izquierda + Derecha + Raíz




```
Main> preOrderB tree4
[1,2,4,5,3,6,7]
Main> inOrderB tree4
[4,2,5,1,6,3,7]
Main> postOrderB tree4
[4,5,2,6,7,3,1]
```