**THE MOST IMPORTANT ADTs**

1. Study the main aspects of the ADTs **TREE**, **BINARY TREE**, **GRAPH and WEIGHTED GRAPH** described in the following table.

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| **ADT** | **DATA** | **OPERATIONS** | **EXAMPLE** |
| Tree | * Set of **nodes** connected with each other in a hierarchical way
* Each element is connected downwards to N nodes (**children**)
* Each element is connected upwards to 1 node (**parent**)
* Exception: the first node has no father (**root**)
* Some nodes have no children (**leaves**)
 | * Insert element (any position)
* Remove element (any position)
* Insertion and removal have to maintain the tree structure
* Search element
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| Binary tree | * Set of **nodes** connected with each other in a hierarchical way
* Each element is connected downwards to max 2 nodes (**children**)
* Each element is connected upwards to 1 node (**parent**)
* Exception: the first node has no father (**root**)
* Some nodes have no children (**leaves**)
 | * Insert element (any position)
* Remove element (leaf)
* Insertion and removal have to maintain the binary structure
* Search element
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| Graph | * Set of **nodes** connected with each other through **edges** (or **arches** or **branches**)
* Each node can be connected to N other nodes (N >=0)
 | * Insert element (any position)
* Remove element (any position)
* Insertion and removal of a node affects also the edges connecting it to the rest of the graph
* Search element
* Search a **path** between two nodes
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| Weighted graph | * Set of **nodes** connected with each other through **edges** (or **arches** or **branches**)
* Each element can be connected to 1 or to N other nodes
* Each edge has a value (**weight**)
 | * Insert element (any position)
* Remove element (any position)
* Search element
* Calculation of the **path** between two nodes using weights
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