

THE CONCEPT OF THE BINARY TREE

The subject of the article is the analysis of the binary tree as an object of mathematical theory. Much attention has been paid to the concept of the binary tree by B. Richmond, A. Odlyzko, F. Ruskey etc.

The history of the tree was prevented by A. Cayley in 1857. The study of the tree was continued by B.D. McKay. He divided the vertices in database of the tree into 18 vertices, G. Royle continued the study. [3]

A binary tree is made of nodes, where each node contains a "left" reference, a "right" reference, and a data element. The topmost node in the tree is called the root.

Every node (excluding a root) in a tree is connected by a directed edge from exactly one other node. This node is called a parent. On the other hand, each node can be connected to arbitrary number of nodes, called children. Nodes with no children are called leaves, or external nodes. Nodes which are not leaves are called internal nodes. Nodes with the same parent are called siblings. [2]

The study showed the following types of binary trees:

- A rooted binary tree is a tree with a root node in which every node has at most two children.
- A full binary tree (sometimes called proper binary tree or 2-tree or strictly binary tree) is a tree in which every node except the leaves has two children.
- A perfect binary tree is a full binary tree in which all leaves are at the same depth or same level. (It is also called a complete binary tree).

A complete binary tree is a binary tree in which every level, except the last, is completely filled, and all nodes are as far left as possible. [1]

The binary tree can be widely applied in our life. This can be shown in competition schedule in sports, family flows, organizations etc. The tree shows the flows of an organization. Using the tree we can know the head of an organization, our relation in a family or our competitor in a sport. It helps to get correct information and saves our time.

The binary tree is frequently used in modern science. We can connect data to solve mathematical problems. The usage of the binary tree helps the programmer to make a system. The application of the binary tree can be found in the computer science. It enables us to see the chart, reduce errors during the program or enter an agreement in an organization. Using the tree, we will know a person's position in an organization or in sports. Our further research will be devoted to more detailed studies of application of binary tree in our daily life and in computer science.

LITERATURE

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