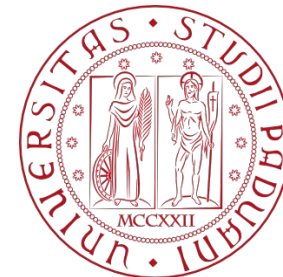


COMPUTER ENGINEERING LABORATORY

Luigi Rizzo

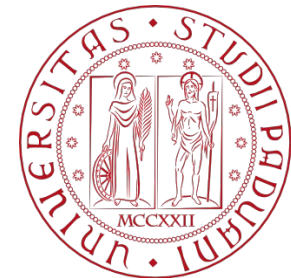
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Lab exercises



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Problem: recording, retrieving, updating and saving Golf Scores by using a doubly linked list.

In recording scores for a golf tournament, we enter the name and score of the player as the player finishes. This information is to be retrieved in each of the following ways:

- Scores and names can be printed in order by ascending or by descending scores.
- Given the name of a player, other players with the same score shall be printed.

Doubly linked lists



The program will print the following menu

- [1] Print list in ascending order of scores*
- [2] Print list in descending order of scores*
- [3] Search player*
- [4] Load new scores*
- [5] Save scores*
- [6] Exit*

Make your choice:

Make use of the three files **scores*n*.txt** in order to update twice golf scores.
Print list in both orders and save data after first reading and after each update.

Problem: recording the data of 20 worldwide capitals from the file capitals.txt in a binary search tree (ordered considering the population) and

- Print the tree in ascending order of population;
- Print the tree in descending order of population;
- Search for a capital and print its population
- Insert new capitals data from file capitals2.txt in the binary search tree, print the above mentioned lists and search for a capital.

Binary search trees



The program will print the following menu

- [1] Print tree in ascending order of population*
- [2] Print tree in descending order of population*
- [3] Search capital*
- [4] Load new capitals*
- [5] Save data in ascending order of population*
- [6] Exit*

Make your choice:

Insert operation



// insertion

```
struct node* insert(struct node * root, int x) {  
    //searching for the place to insert  
    if (root == NULL)  
        return newNode(x);  
    else if (x > root->data) // x is greater. Should be inserted to the right  
        root->right_child = insert(root->right_child, x);  
    else // x is smaller and should be inserted to left  
        root->left_child = insert(root->left_child, x);  
    return root;  
}
```

// searching operation

```
struct node* search(struct node * root, int x) {  
    if (root == NULL || root->data == x) //if root->data is x the element is found  
        return root;  
    else if (x > root->data) // x is greater, so we will search the right subtree  
        return search(root->right_child, x);  
    else //x is smaller than the data, so we will search the left subtree  
        return search(root->left_child, x);  
}
```