

Lab: Trees–Task2, 1 March 2022

Due: 8 March 2022

2 Task: Search Operation on B-trees

2.1 Write an algorithm in pseudocode to search a B-tree

In the Trees-2 lecture, there is an example of searching for an element in a B-Tree on slide 9. The tree (of order 4) is shown in Fig. 1.

1. Consider the example and compare it to the algorithm to search a Value in a BST (Lecture Trees-1, slide 25).
2. Adapt this algorithm for a B-tree using the explanation on slide 9 of the Trees-2 lecture.
3. Write down your pseudocode using any notation you are comfortable with. For example, you can do it in the same way as on slide 25 in lecture Trees-1.

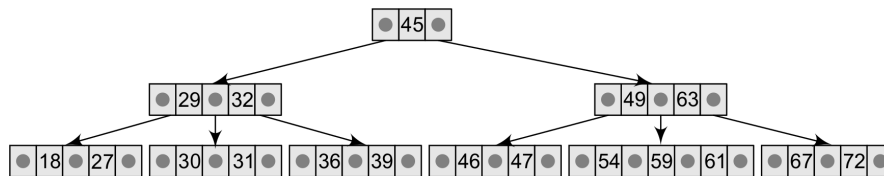


Figure 1: B-tree of order 4

2.2 Create a function to search a B-tree

Extend the program from task 3 in the Trees-2 exercise by adding a search functionality.

- Implement in C the algorithm from (2.1).
- Add function to search for a key in a B-tree:

```
struct node *search(struct node *tree, int key)
```


It should return the node where the key is found.
- Reuse the code of `ex_btree_3.c` from the exercise solutions.
- Add to the code of `int main()` that you reuse from `ex_btree_3.c` a loop to enter a value to search for and then output the result of search.