Mahidol University
International College

# ICCS315 Applied Algorithms

Assignment 1 Report

**Written by**
Krittin Nisunarat 6280782

30 Jan 2022

# Contents

# Chapter 1

# Resizeable Arrays

# Chapter 2

# Space usage of skip lists

# Chapter 3

# Skip lists

# Chapter 4

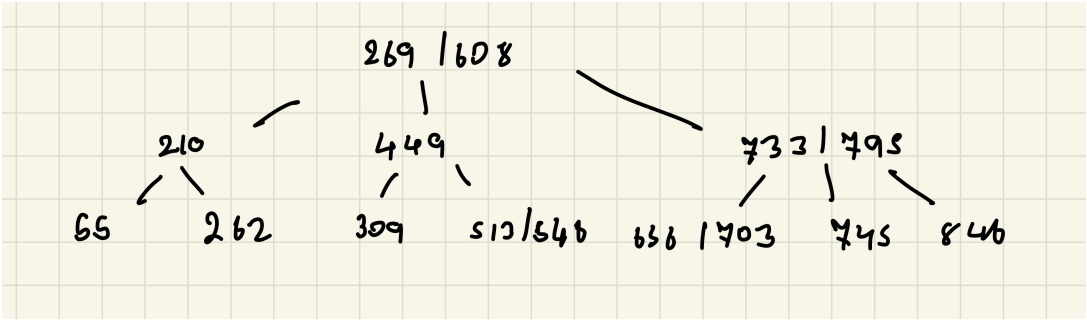
# (a,b) tree

## 4.1 Multiple keys insertion.

Starting with an empty tree, we want to insert the following keys:

733, 703, 608, 846, 309, 269, 55, 745, 548, 449, 513, 210, 795, 656, 262

The result of *(2,3) tree* is




## 4.2 Key deletion

Suppose that we want to delete 309 in *(2,3) tree*, it falls into case 1 which we need to steal from sibling.

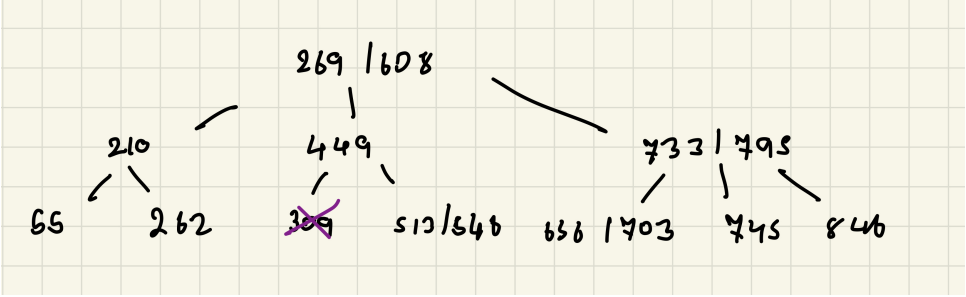



Figure 4.1: Unbalanced tree without key 309

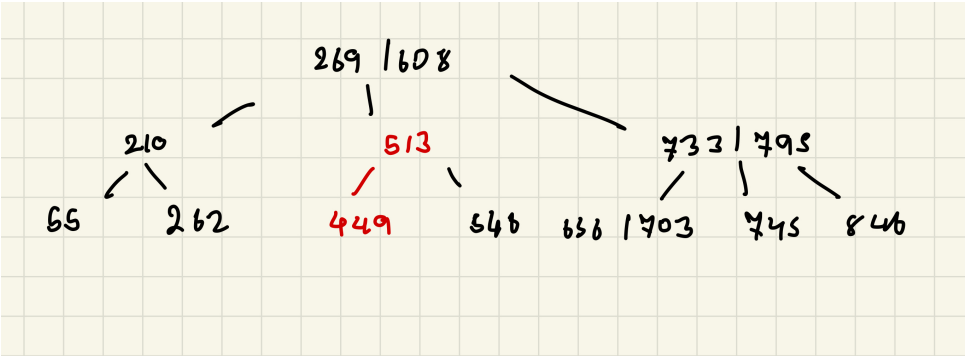



Figure 4.2: Balanced tree after finding replacement by stealing

As you can see in Figure 4.2, the replacements are 513 and 449 which 513 is the new parent node that has 449 and 548 as a child nodes.

$$\alpha_{\text{me}} = a - 1 + 1$$

# Chapter 5

# B-tree speed