CSD2181/2183 – Data Structure

Exercises

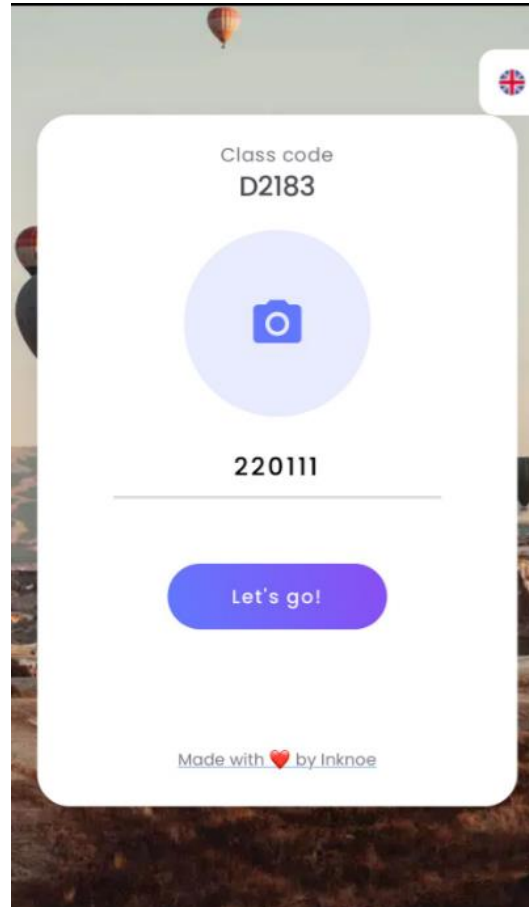**Nisha Jain**

Assistant Professor

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Introduction – Data Structure Exercises

https://www.classpoint.app/

OR

Introduction – Data Structure Exercises

- Purpose: to reinforce what you have learned and practiced in lectures.

- The exercise session is conducted face to face in class.

- It consists of a few MCQs to be solved within class.

- Limited time is given for each question (answer will be discussed afterwards).

- You are required to login to ClassPoint with your student ID.

- So, bring along your laptop or devices with Internet access.

- Attendance is compulsory and there is no make up.

- Exercises are marked considering your overall performance in the module.

Exercise
Hashing

Exercise 11 – Hashing

11.1 Consider the hash function below in an open addressing hash table

$$h(k) = k\ \%7$$

Assuming double hashing with g(k) = 5 – k%5

Determine number of probes after inserting 72

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5

⭐ Multiple Choice

Exercise 11 – Hashing

11.1 Consider the hash function below in an open addressing hash table

$$h(k) = k \% 7$$

Assuming double hashing with $g(k) = 5 - k\%5$

Determine number of probes after inserting 72

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5

h(k) = 72 % 7 = 2
g(k) = 5 – 72 % 5 = 3
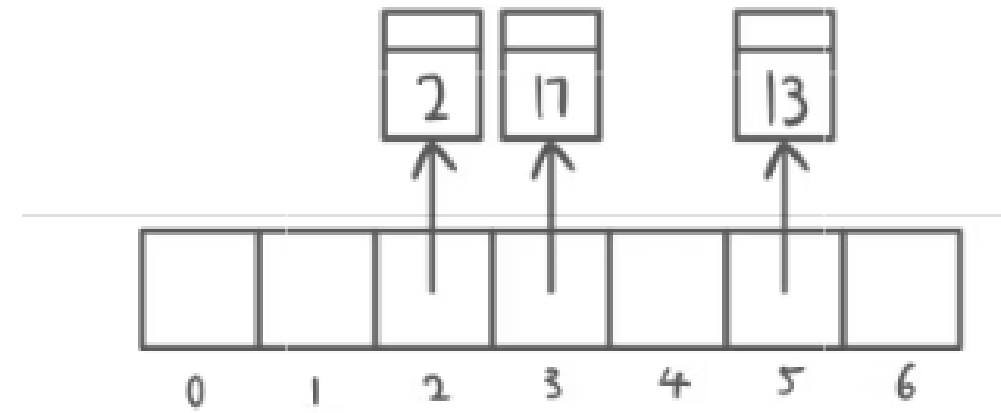h(k) + g(k) = 2+3 = 5
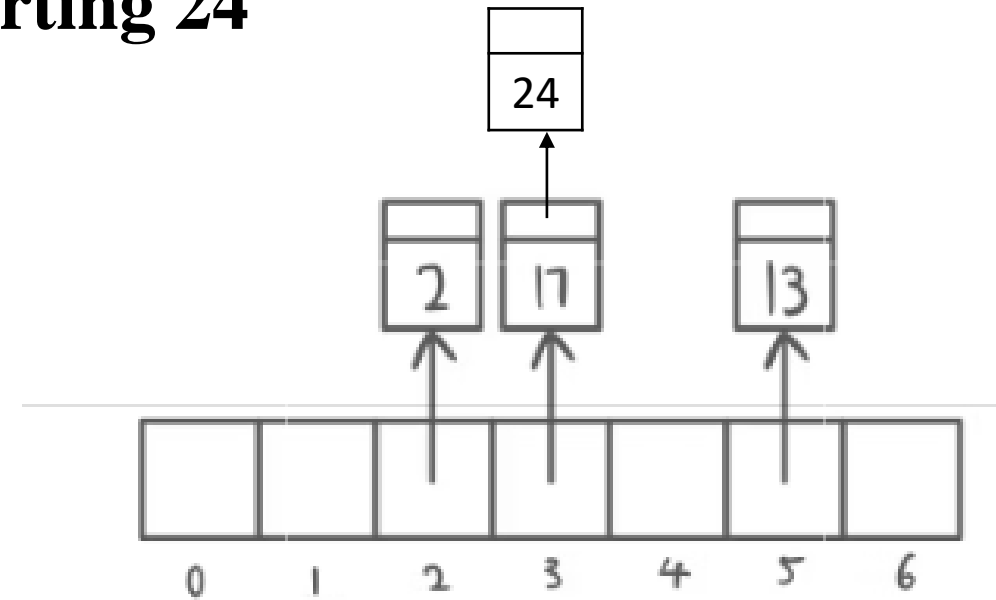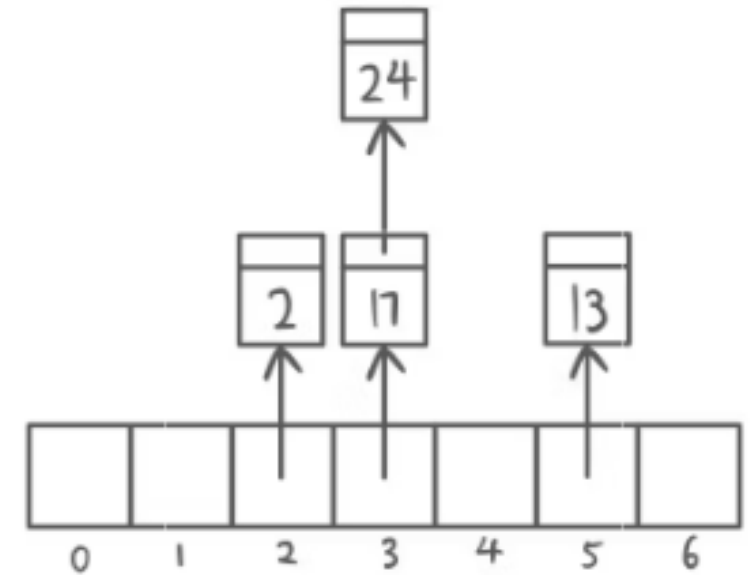h(k)+ 2g(k) = 2 + 6 = 8%7 = 1

Exercise 11 – Hashing

11.2 Consider the hash function below in a chaining hash table

$$h(k) = k \; \%7$$

Determine number of probes after inserting 24

A. 0
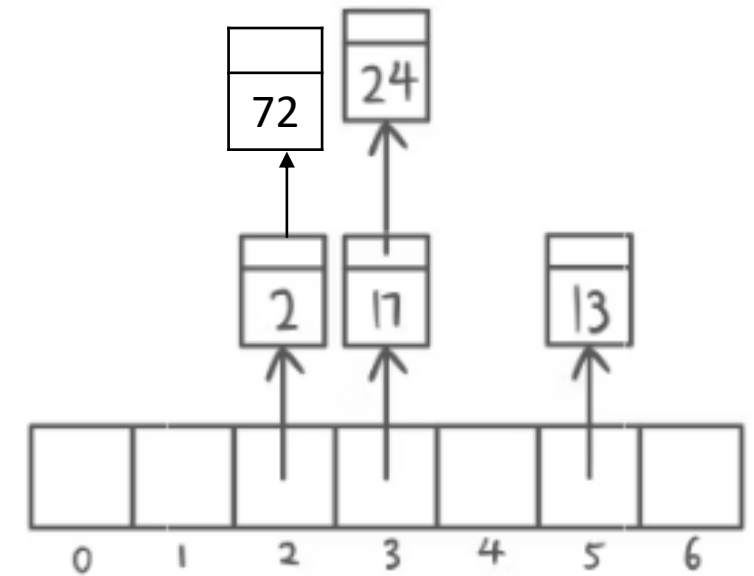B. 1
C. 2
D. 3
E. 4
F. 5

⭐ Multiple Choice

Exercise 11 – Hashing

11.2 Consider the hash function below in a chaining hash table

$$h(k) = k \ \%7$$

Determine number of probes after inserting 24

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5

Exercise 11 – Hashing

11.3 Consider the hash function below in a chaining hash table

$$h(k) = k \%7$$

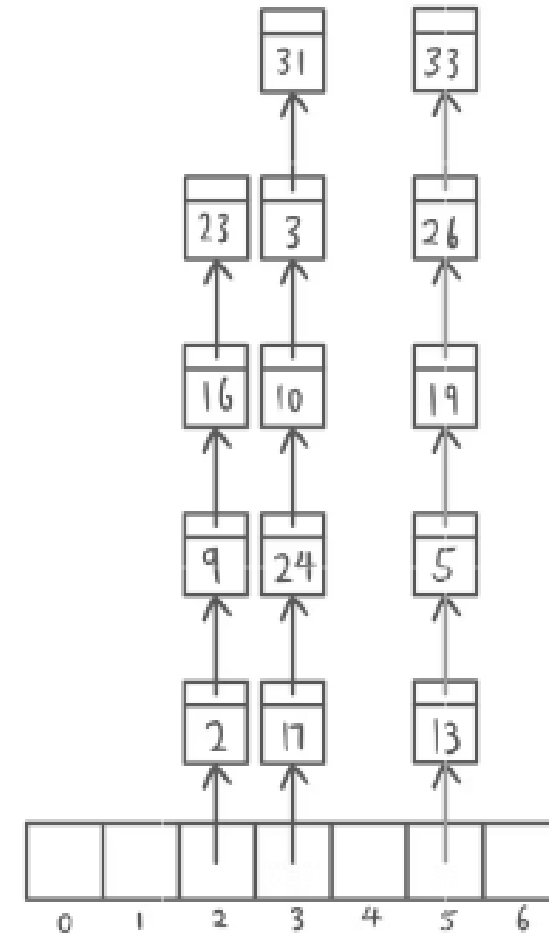**Determine number of probes after inserting 72**

A. 0
B. 1
C. 2
D. 3
E. 4
F. 5

🌟 Multiple Choice

Exercise 11 – Hashing

11.3 Consider the hash function below in a chaining hash table

$$h(k) = k \; \%7$$

Determine number of probes after inserting 72

    A. 0
    B. 1
    C. 2
    D. 3
    E. 4
    F. 5

Exercise 11 – Hashing

11.4 Determine the load factor of the given chaining hash table.

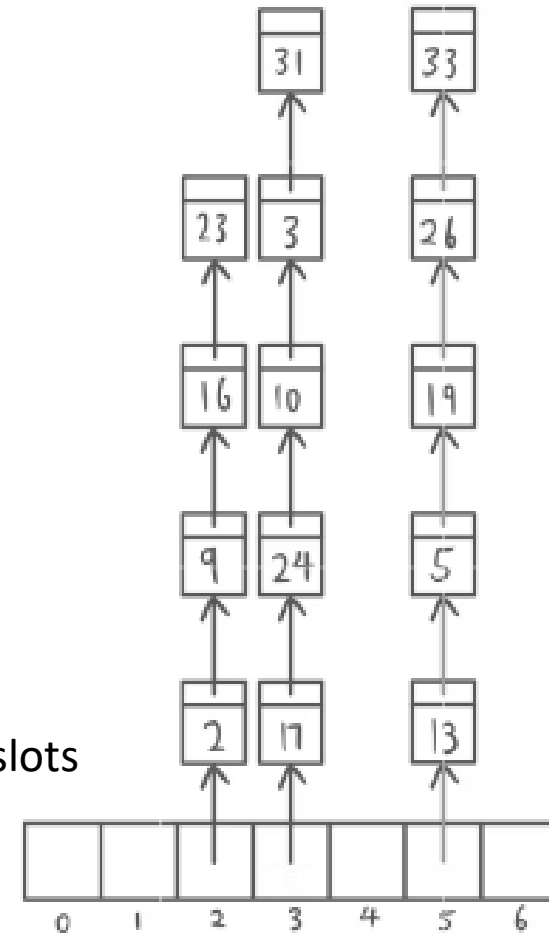A. 1
B. 2
C. 3/6
D. 3/7
E. 5/7
F. 14/3

⭐ Multiple Choice

Exercise 11 – Hashing

11.4 Determine the load factor of the given chaining hash table.

A. 1
B. 2
C. 3/6
D. 3/7
E. 5/7
F. 14/3

Load factor = number of keys stored/number of slots
= 14/7 = 2

Exercise
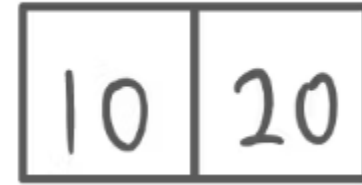2-3 Search Trees

Exercise 11 – 2-3 Trees

11.5 Consider the following 2-3 tree, how many nodes will it have after inserting 15?
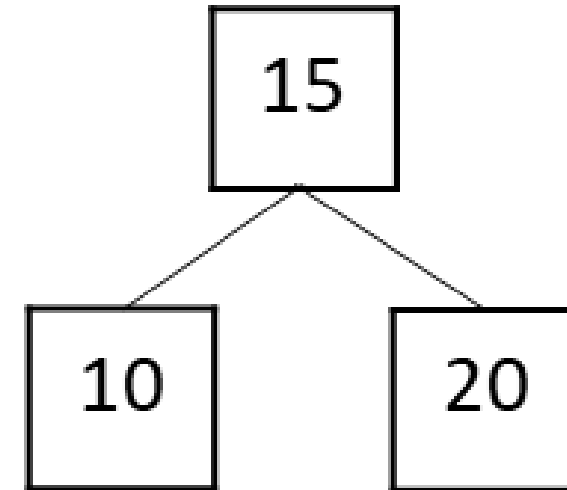
A. 1
B. 2
C. 3
D. 4

10	20

⭐ **Multiple Choice**

Exercise 11 – 2-3 Trees

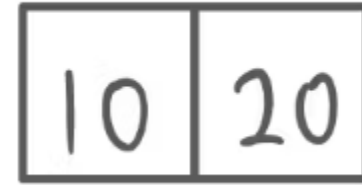**11.5 Consider the following 2-3 tree, how many nodes will it have after inserting 15?**

    A. 1
    B. 2
    C. 3
    D. 4

Exercise 11 – 2-3 Trees

11.6 Consider the following 2-3 tree, how many nodes will it have after inserting 30?

A. 1
B. 2
C. 3
D. 4

Exercise 11 – 2-3 Trees

11.6 Consider the following 2-3 tree, how many nodes will it have after inserting 30?
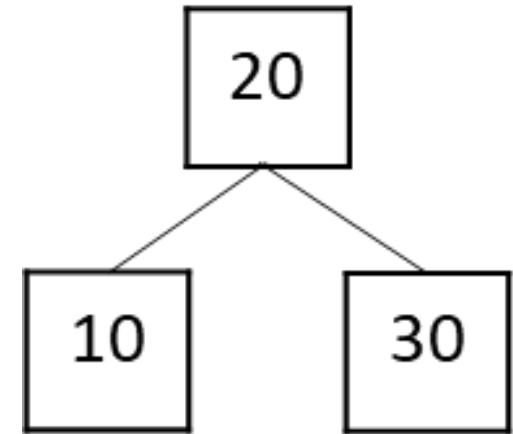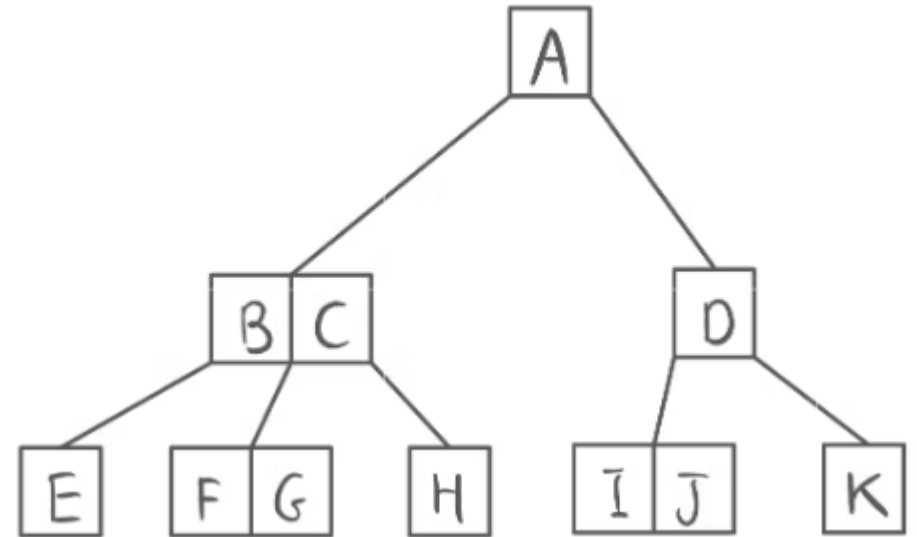
A. 1
B. 2
C. 3
D. 4

Exercise 11 – 2-3 Trees

11.7 Consider the following 2-3 tree, what is the inorder traversal of the tree?

A. ABCDEFGHIJK
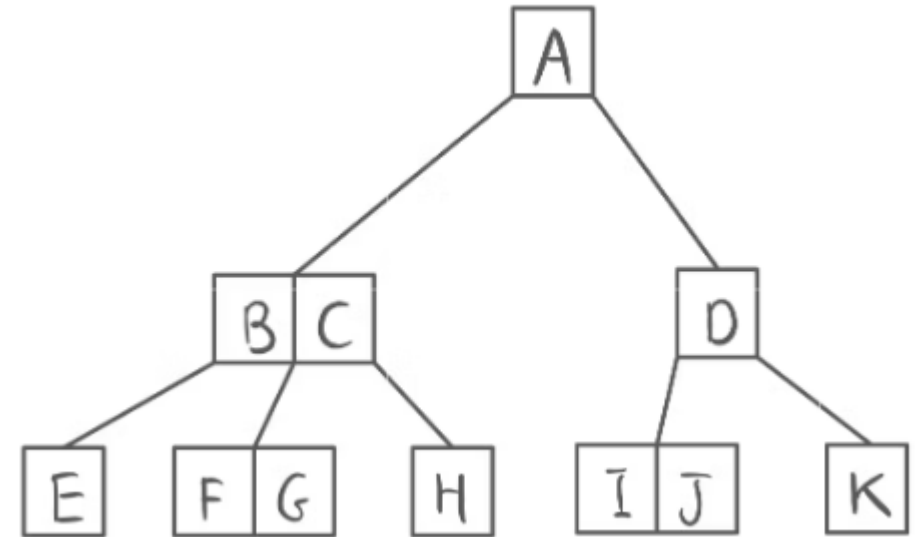B. EBFGCHAIJDK
C. EBFCGHAIDJK
D. EFHBHCIJKDA
E. ABEFCGHDIJK

Multiple Choice

Exercise 11 – 2-3 Trees

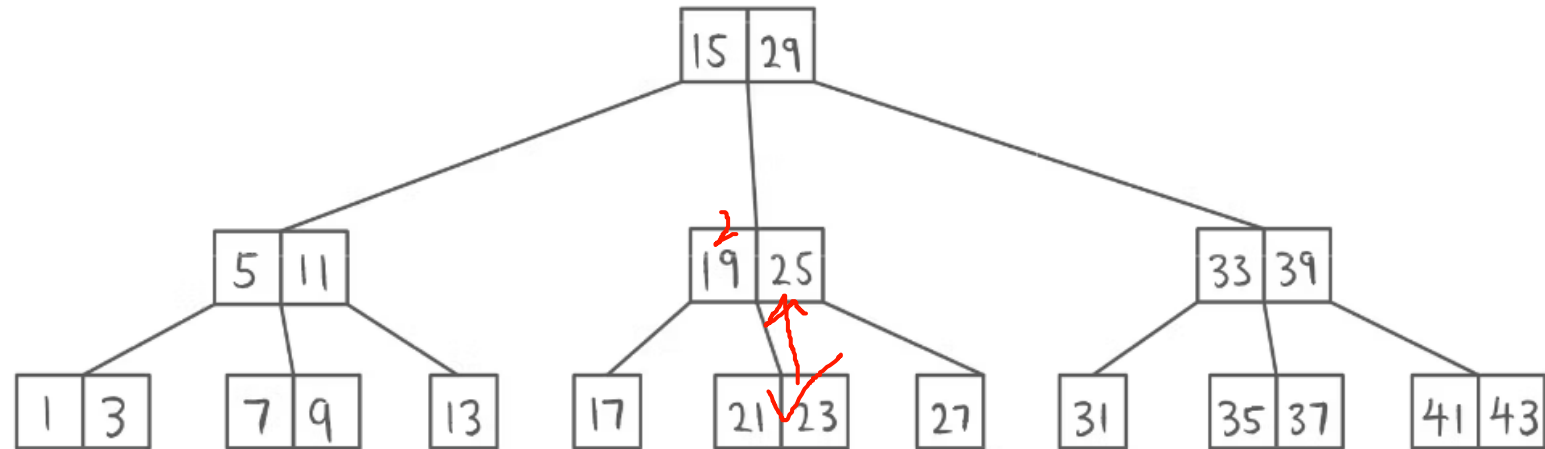**11.7 Consider the following 2-3 tree, what is the inorder traversal of the tree?**

    A. ABCDEFGHIJK
    B. <mark>EBFGCHAIJDK</mark>
    C. EBFCGHAIDJK
    D. EFHBHCIJKDA
    E. ABEFCGHDIJK

Exercise 11 – 2-3 Trees

11.8 Consider the following 2-3 tree, how many splits after inserting 22?

A. 0
B. 1
C. 2
D. 3
E. 4
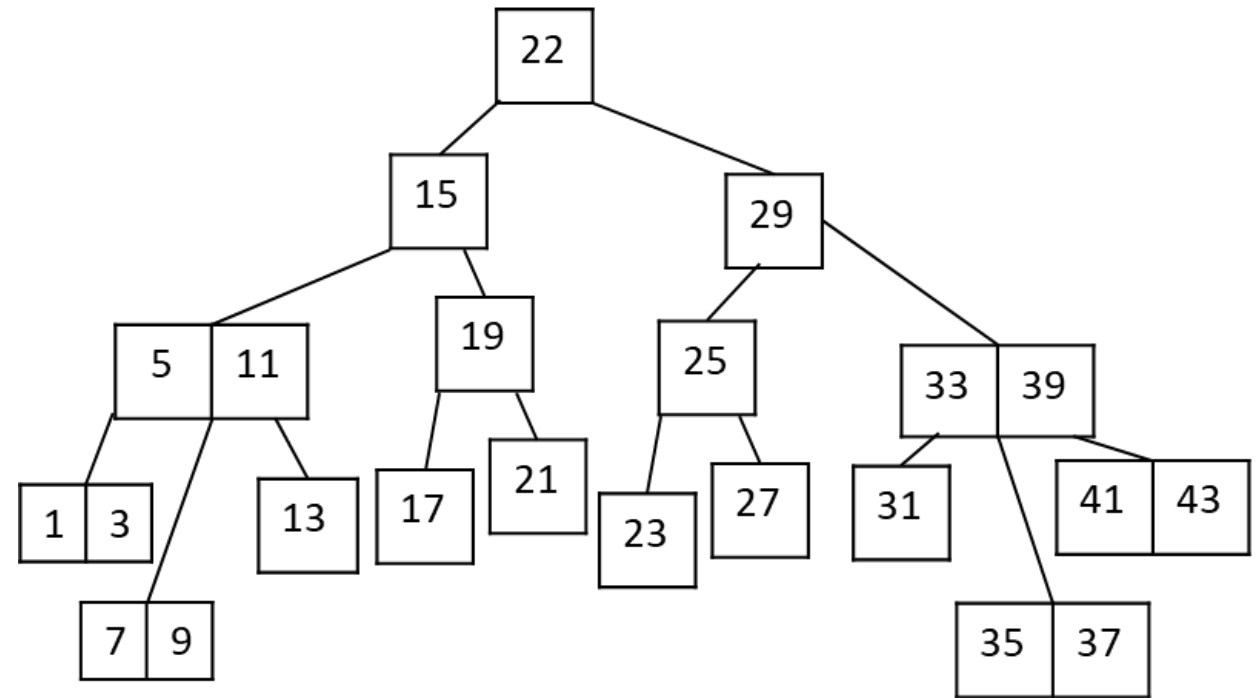

Multiple Choice

Exercise 11 – 2-3 Trees

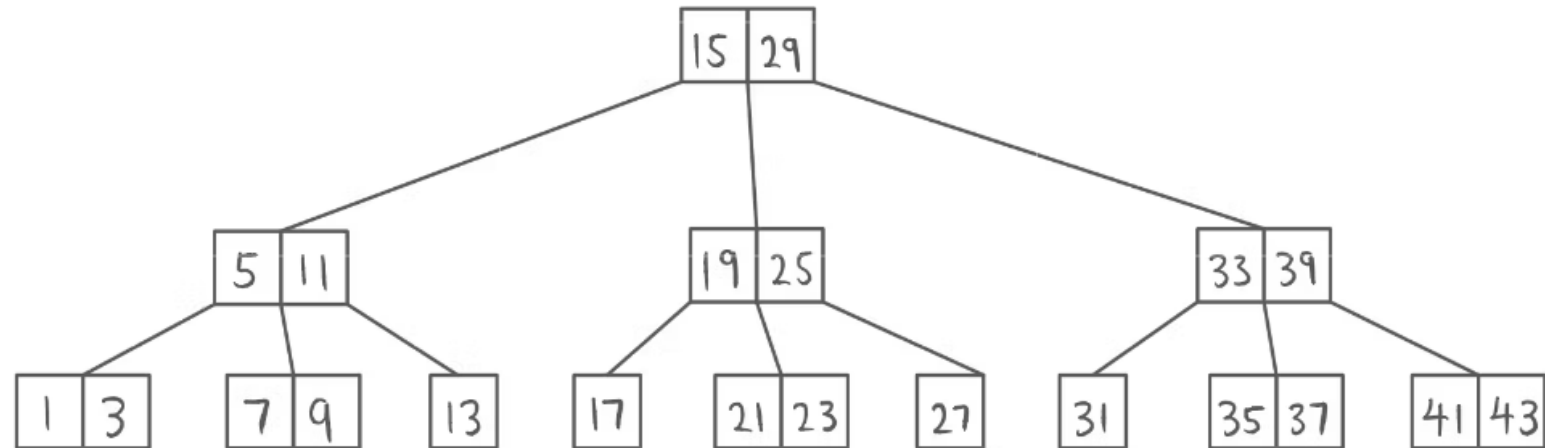**11.8 Consider the following 2-3 tree, how many splits after inserting 22?**

A. 0
B. 1
C. 2
D. 3
E. 4

Exercise 11 – 2-3 Trees

11.9 Consider the following 2-3 tree, how many merge after removing 29?
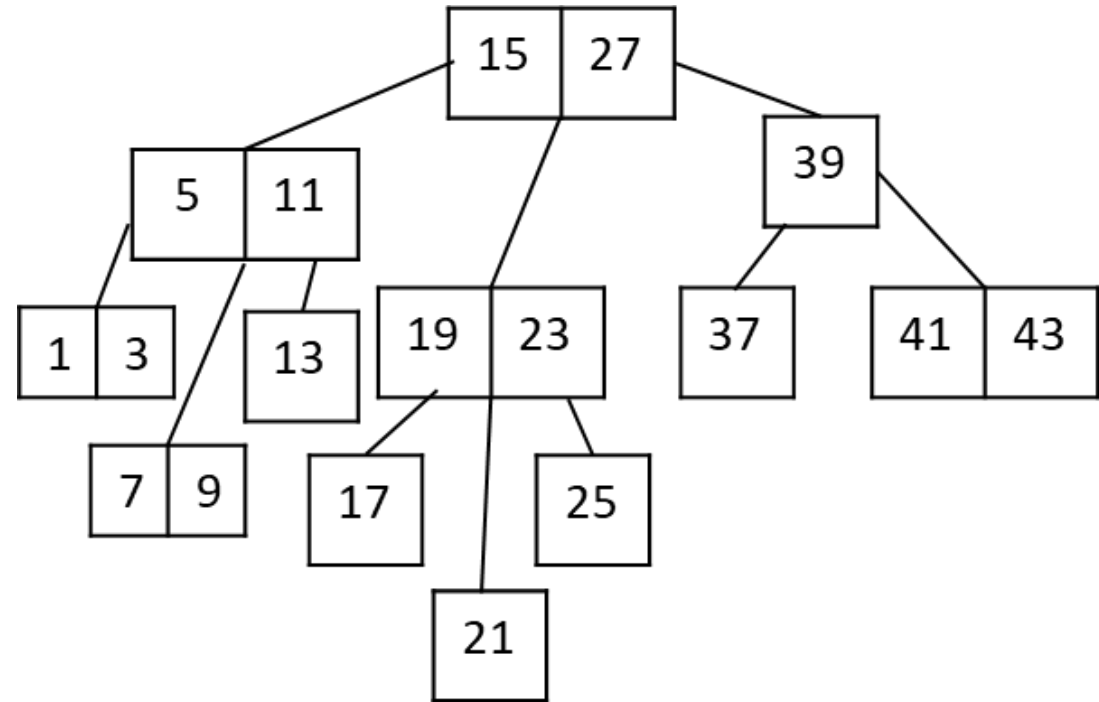
A. 0
B. 1
C. 2
D. 3
E. 4

Multiple Choice

Exercise 11 – 2-3 Trees

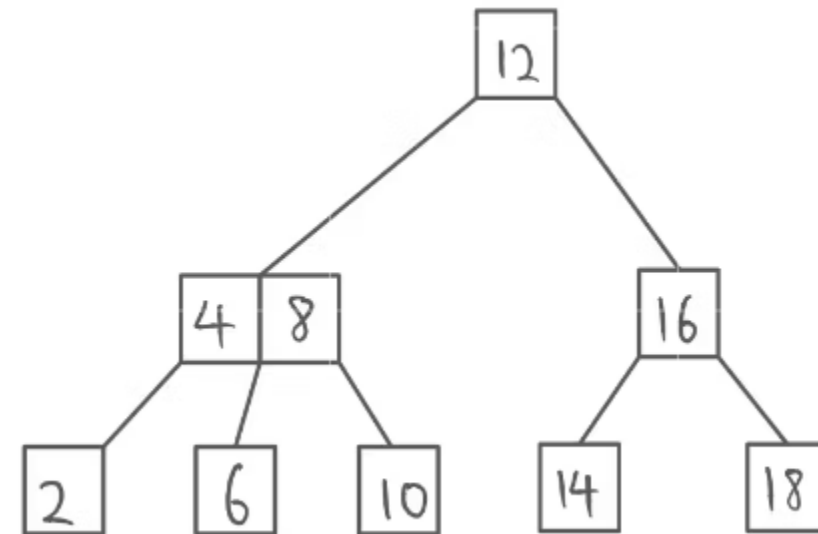**11.9 Consider the following 2-3 tree, how many merge after removing 29?**

A. 0
B. 1
C. 2
D. 3
E. 4

Exercise 11 – 2-3 Trees

11.10 Consider the following 2-3 tree, how many merge after removing 14?
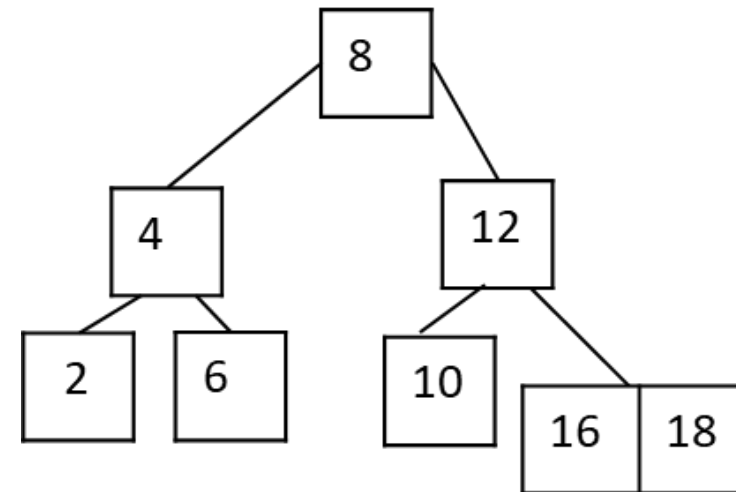
A. 0
B. 1
C. 2
D. 3
E. 4

⭐ Multiple Choice

Exercise 11 – 2-3 Trees

11.10 Consider the following 2-3 tree, how many merge after removing 14?

A. 0
B. 1
C. 2
D. 3
E. 4

Exercise 11 – 2-3 Trees

11.11 Consider the following 2-3 tree, how many merge after removing 12?

A. 0
B. 1
C. 2
D. 3
E. 4

⭐ Multiple Choice

Exercise 11 – 2-3 Trees

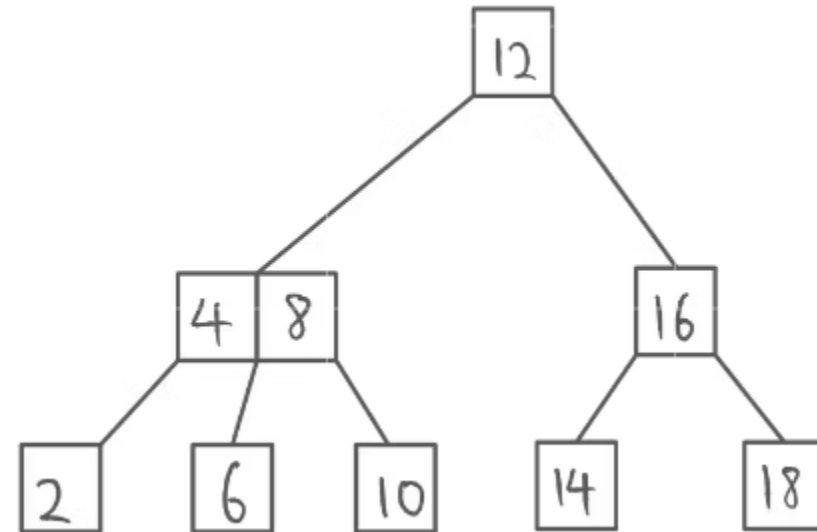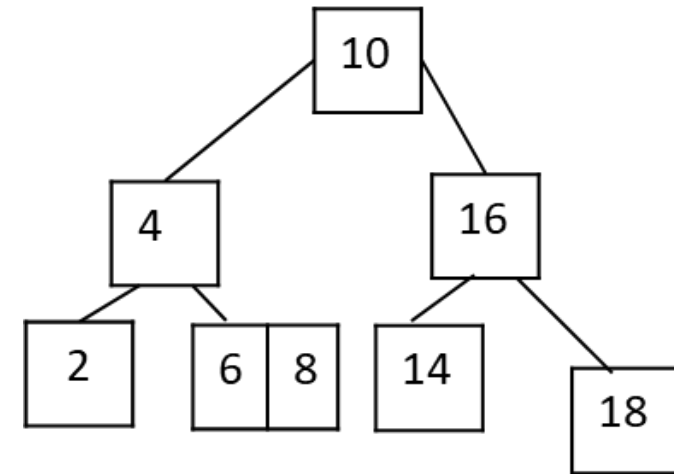**11.10 Consider the following 2-3 tree, how many merge after removing 12?**

    A. 0
    B. 1
    C. 2
    D. 3
    E. 4

The End