Problem Set 2: Part I

Problem 1: Fixed-length and variable-length records

1.1 and 1.2
record contents

15172	Barbie#-------------	2023	PG-13

length in bytes

34

show how you computed the length:

len(id) + max_len(name) + len(year) + max_len(rating) = 5 + 20 + 4 + 5 = 34 bytes

1.3 and 1.4
record contents

5	15172	6	Barbie	3	2023	5	PG-13

length in bytes

28

show how you computed the length:

len(id) + len('Barbie') + len(year) + len('PG-13') + metadata = 5 + 6 + 4 + 5 + 4 * 2 = 28 bytes

1.5 and 1.6
record contents

10	15	21	25	30	15172	Barbie	2023	PG-13

length in bytes

30

show how you computed the length:

len(id) + len('Barbie') + len(year) + len('PG-13') = 5 + 6 + 4 + 5 + 5 * 2 = 30 bytes

1.7
record contents
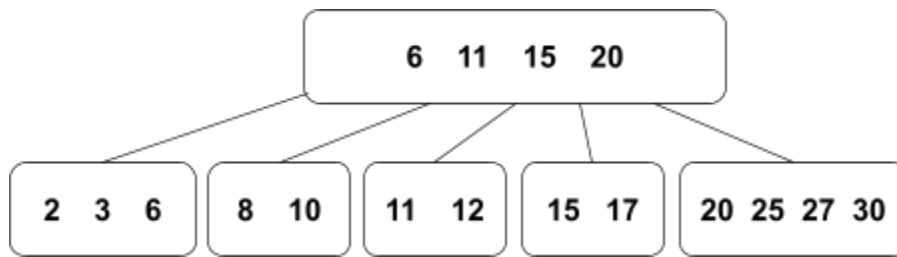
10	13	31	-1	36	87654	The Color Purple	PG-13

Problem 2.1: Insertions into a B-tree
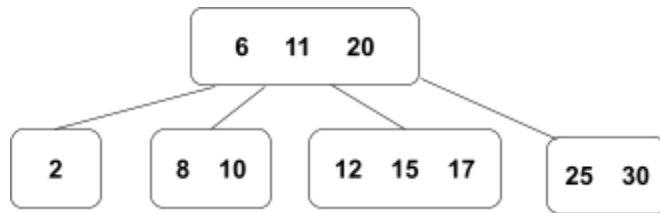
Problem 2.2: Insertions into a B+tree

Problem 2.3: Insertions into a linear hash table

before first increase

0	6, 8, 12, 2, 10, 30
1	5, 17, 11, 25

after first increase

0	8, 30
1	5, 17, 11, 25, 3
2	6, 12, 2, 10

before second increase

0	8, 30
1	5, 17, 11, 25, 3, 27
2	6, 12, 2, 10

after second increase

0	8, 30
1	5, 25
2	6, 12, 2, 10
3	17, 11, 3, 27