Problem Set 2: Part I

Problem 1: Fixed-length and variable-length records

1.1 and 1.2

record contents

9115530	1567113	BEST-ACTRESS#----------	2022

length in bytes

39

show how you computed the length:

7 + 7 + 23 + 2 = 39
7 bytes CHAR for movie_id
7 bytes CHAR for person_id
23 bytes VARCHAR for type
and 2 bytes INTEGER for year

1.3 and 1.4

record contents

7	9115530	7	1567113	12	BEST-ACTRESS	2	2022

length in bytes

36

show how you computed the length:

2 * 4 + 7 + 7 + 12 + 2 = 36
2 * 4 bytes for precede
7 bytes for movie_id
7 bytes for person_id
12 bytes for type
and 2 bytes for year

1.5 and 1.6

record contents

10	17	24	36	38	9115530	1567113	BEST-ACTRESS	2022

length in bytes

38

show how you computed the length:

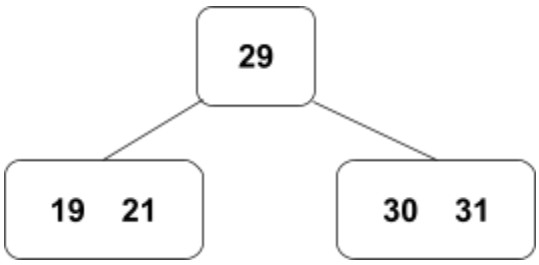
2 * (4 + 1) + 7 + 7 + 12 + 2 = 38
2 * (4 + 1) bytes for header offsets
7 bytes for movie_id
7 bytes for person_id
12 bytes for type
and 2 bytes for year

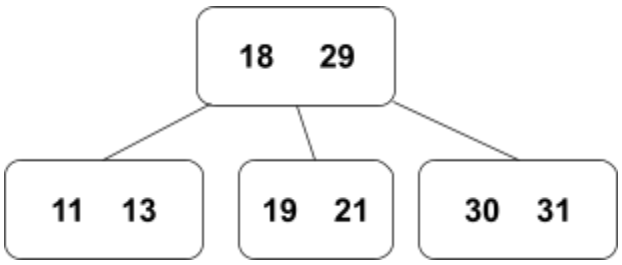
1.7

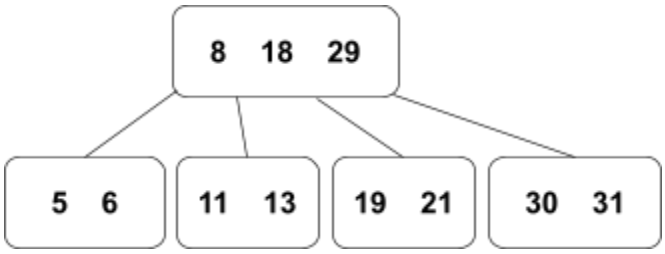
record contents

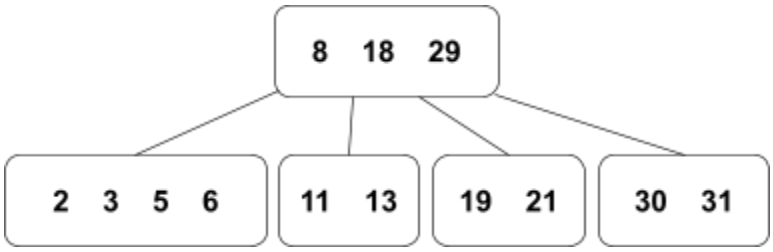
10	-1	17	29	31	1036646	BEST-PICTURE	2022

Problem 2.1: Insertions into a B-tree

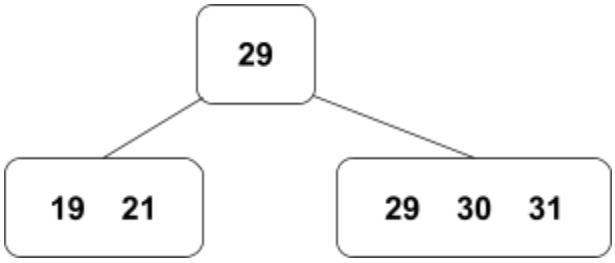


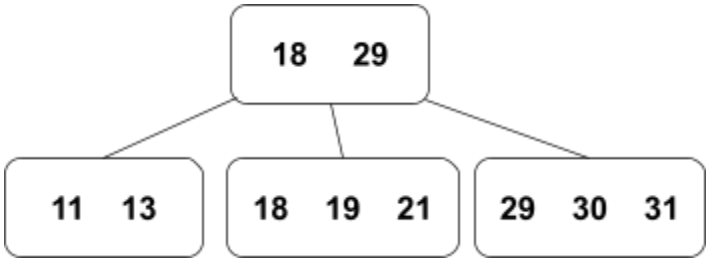


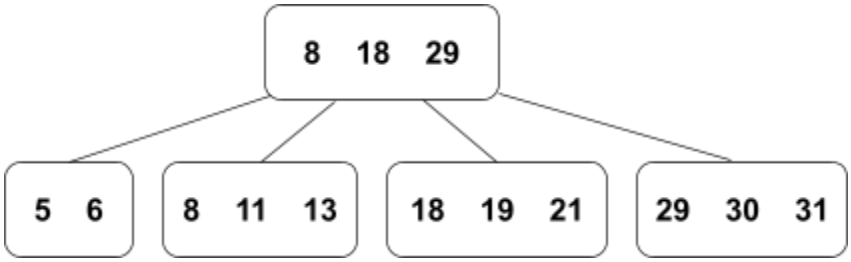


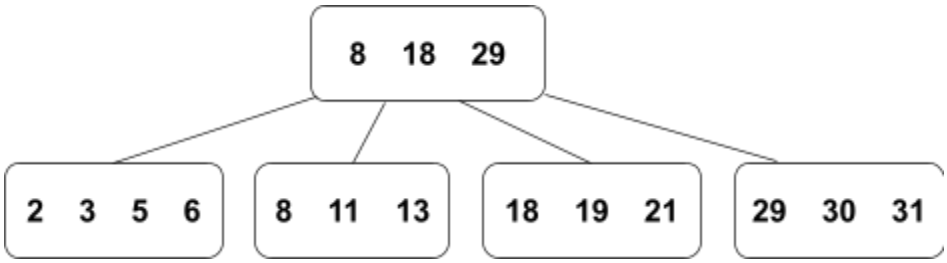


Problem 2.2: Insertions into a B+tree









Problem 2.3: Insertions into a linear hash table

before first increase

0	30, 18
1	31, 29, 21, 19, 13

after first increase

0	
1	31, 29, 21, 19, 13
2	30, 18

before second increase

0	8
1	31, 29, 21, 19, 13, 11
2	30, 18, 6

after second increase

0	8
1	29, 21, 13
2	30, 18, 6
3	31, 19, 11

before third increase

0	8
1	29, 21, 13, 5
2	30, 18, 6, 2
3	31, 19, 11, 3

after third increase

0	8
1	29, 21, 13, 5
2	30, 18, 6, 2
3	31, 19, 11, 3
4	

final state of the table

0	8
1	29, 21, 13, 5
2	30, 18, 6, 2
3	31, 19, 11, 3
4	