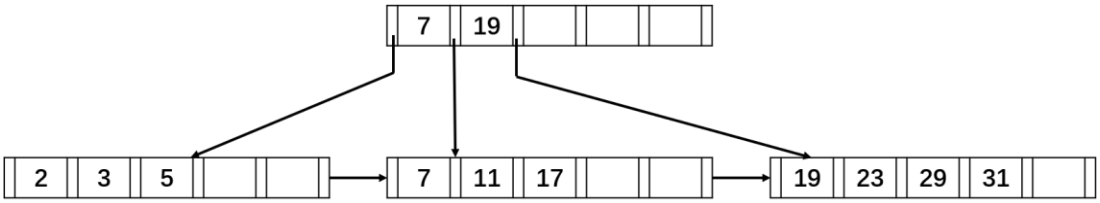
COMP5112. Tutorial 12: Storage and indexing

The following questions are adapted from "Database System Concepts".

Question 1.

You are given the following B^+-tree.



Perform the following sequence of operations on the above B^+-tree.

Insert 9, Insert 10, Insert 8, Delete 23, Delete 19

Draw a tree after each operation.

Solution of Question 1:

Insert 9:

Insert 10:

Insert 8:

Delete 23:

Delete 19:

Question 2.

You are given the following relational table.

76766	Crick	Biology	72000
10101	Srinivasan	Comp. Sci.	65000
45565	Katz	Comp. Sci.	75000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000
12121	Wu	Finance	90000
76543	Singh	Finance	80000
32343	El Said	History	60000
58583	Califieri	History	62000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
33465	Gold	Physics	87000

Build a hash index for the first attribute (id).
We will use 4 buckets and the hash function H(id)=id mod 4.
Assume that each bucket can store 4 keys, and bucket overflow is handled by overflow chaining.

Solution of Question 2: