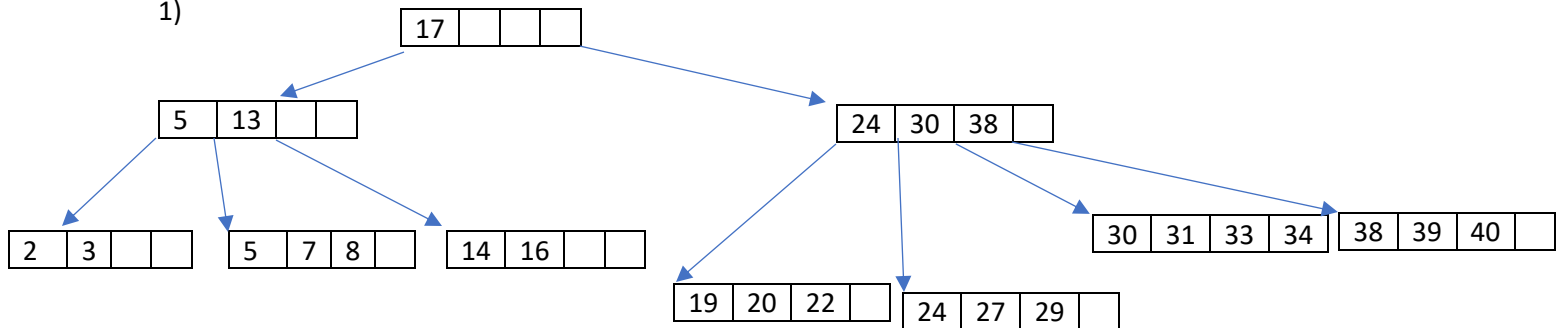


PQuestion 1

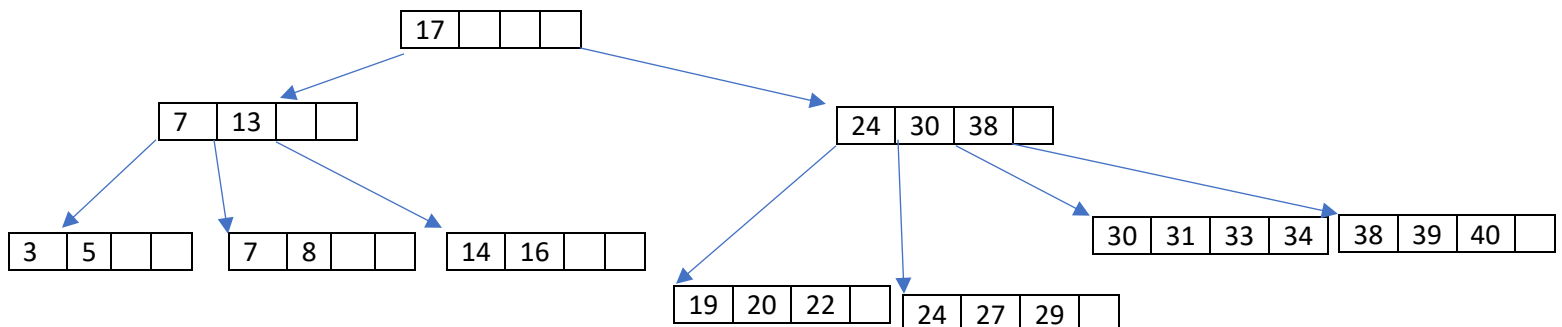
- 1) $\Pi \text{ ename } (\pi \text{ ename } (E \bowtie \sigma \text{ mgr_eid } P) \bowtie \sigma \text{ ename } E)$
- 2) $\Pi \text{ ename } (E \bowtie W \bowtie (\sigma \text{ pname } <> \text{'Database'} P))$
- 3) $P (P1, \pi \text{ ename } (E \bowtie W \bowtie (\sigma \text{ pname } = \text{'Database'} P))$
 $P (P2, \pi \text{ ename } (E \bowtie W \bowtie (\sigma \text{ pname } = \text{'DataMining'} P))$
 $\Pi \text{ ename } (P1 \text{ intersect } P2)$
- 4) $P \text{ P1_id} \rightarrow \text{mgr_id} (P1, P)$
 $\Pi \text{ ename } (E \bowtie (\Sigma \text{ mgr_id } = \text{P1_id } (P \times P1)))$
- 5) $\Pi \text{ pname } (P \bowtie ((\pi \text{ eid, pid } W) / E))$

Question 2

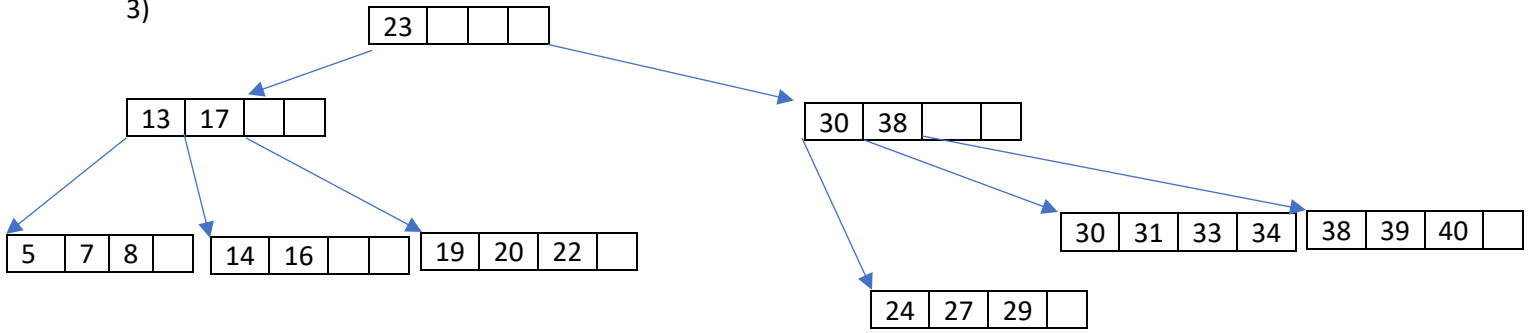
1)



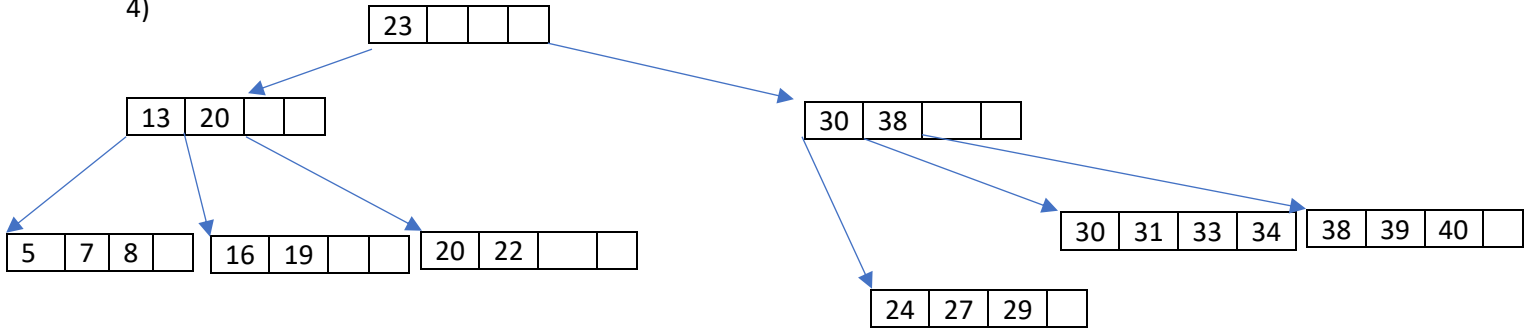
2)



3)



4)



LAB

1)

Σ ct E.emp_no

from employees E, titles T, dept_emp DE, departments D

where E.emp_no = T.emp_no AND E.emp_no = DE.emp_no

AND DE.dept_no = D.dept_no AND D.dept_name = 'Research'

AND T.title = 'Manager';

2)

```

Σct DISTINCT E.emp_no
from employees E, dept_emp DE, departments D
where E.emp_no = DE.emp_no AND DE.dept_no = D.dept_no
AND E.first_name = 'Laurentiu' AND D.dept_name <> 'Development'
UNION
Σct E.emp_no
from employees E, dept_emp DE, departments D
where E.emp_no = DE.emp_no AND DE.dept_no = D.dept_no
AND E.last_name = 'Cesareni' AND D.dept_name <> 'Research';

```

3)

```

Σct DISTINCT E.first_name
From employees E, dept_manager DM, departments D
where E.emp_no = DM.emp_no AND DM.dept_no = D.dept_no
AND D.dept_name = 'Sales';

```

4)

```

Σct D.dept_no, count (*)
from employees E, dept_emp DE, departments D
where E.emp_no = DE.emp_no AND DE.dept_no = D.dept_no
group by D.dept_no
having count(*) > 1;

```

5)

```

Σct E.first_name
from employees E, salaries S

```

where E.emp_no = S.emp_no AND S.salary IN

(Σct max (S2.salary)

from employees E2, dept_emp DE, departments D, salaries S2

where E2.emp_no = DE.emp_no AND DE.dept_no = D.dept_no

AND S2.emp_no = E2.emp_no AND D.dept_name = 'Sales');