

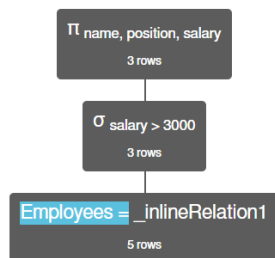
Comp 3005 assignment 1 part 1 Derrick Zhang 101232374

Question 1

```
1 Employees = {
2   empid, name, position, salary, deptid
3   101, 'Alice', 'Manager', 3000, 'D01'
4   102, 'Bob', 'Manager', 4500, 'D02'
5   103, 'Charlie', 'Developer', 4000, 'D01'
6   104, 'David', 'Developer', 3800, 'D03'
7   105, 'Emily', 'Manager', 2900, 'D03'
8 }
9 Departments = {
10  deptid, deptname, managerid
11  'D01', 'IT', 101
12  'D02', 'Finance', 102
13  'D03', 'Marketing', 105
14 }
15 Projects = {
16  projectid, projectname, leadempid, budget
17  'P01', 'Alpha', 101, 500000
18  'P02', 'Beta', 103, 2000000
19  'P03', 'Gamma', 102, 750000
20  'P04', 'Delta', 104, 1250000
21 }
```

1.

```
22
23  $\pi$  name, position, salary ( $\sigma$  salary > 3000 Employees)
24
25
```



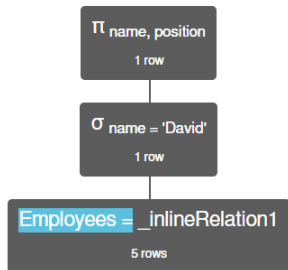
π name, position, salary (σ salary > 3000 _inlineRelation1)

Execution time: 12 ms

name	position	salary
'Bob'	'Manager'	4500
'Charlie'	'Developer'	4000
'David'	'Developer'	3800

2.

```
22
23  $\pi$  name, position (  $\sigma$  name = 'David' Employees)
24
25
```



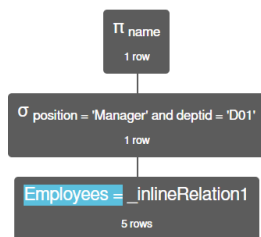
π name, position (σ name = 'David' _inlineRelation1)

Execution time: 6 ms

name	position
'David'	'Developer'

3.

22 π name (σ position = 'Manager' and deptid = 'D01' Employees)



π name (σ position = 'Manager' and deptid = 'D01' _inlineRelation1)

Execution time: 5 ms

name
'Alice'

4.

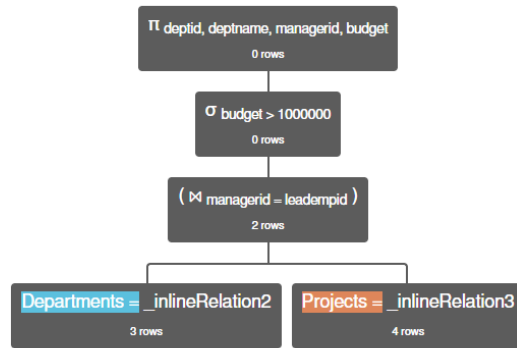
```

23  $\pi$  deptid, deptname, managerid, budget (  $\sigma$  budget > 1000000 ( Departments  $\bowtie$  managerid=leadempid Projects ))
24
25
26
27

```

[▶ execute query](#)

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π deptid, deptname, managerid, budget (σ budget > 1000000 (_inlineRelation2 \bowtie managerid = leadempid _inlineRelation3))

Execution time: 3 ms

deptid	deptname	managerid	budget
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< >

5.

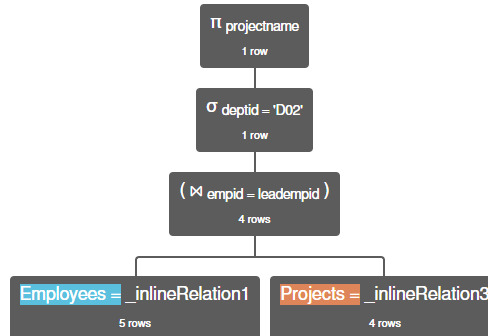
```

23 |  $\pi$  projectname (  $\sigma$  deptid = 'D02' (Employees  $\bowtie$  empid = leadempid Projects))
24 |

```

[▶ execute query](#)

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π projectname (σ deptid = 'D02' ($_inlineRelation1$ \bowtie empid = leadempid $_inlineRelation3$))

Execution time: 4 ms

projectname

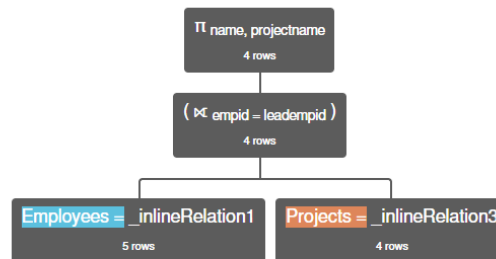
'Gamma'

```

23 |  $\pi$  name, projectname (Employees  $\bowtie$  empid = leadempid Projects)
24 |
25 |

```

[▶ execute query](#)



π name, projectname ($_inlineRelation1$ \bowtie empid = leadempid $_inlineRelation3$)

Execution time: 3 ms

name	projectname
'Alice'	'Alpha'
'Charlie'	'Beta'
'Bob'	'Gamma'
'David'	'Delta'

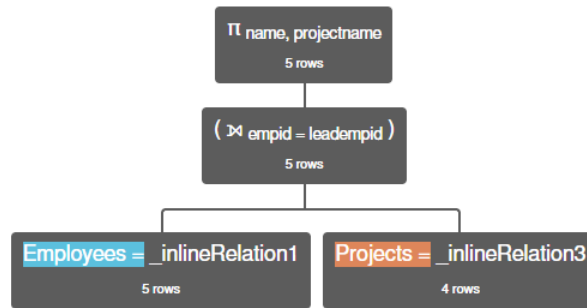
7.

```

22
23  $\pi$  name, projectname(Employees  $\bowtie$  empid = leadempid Projects)
24
25

```

▶ execute query



π name, projectname (_inlineRelation1 \bowtie empid = leadempid _inlineRelation3)

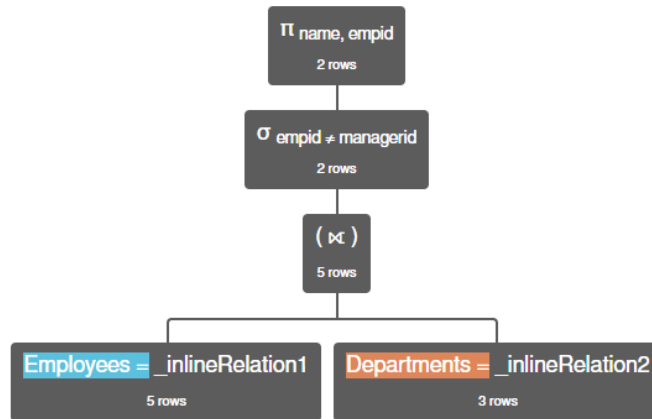
Execution time: 4 ms

name	projectname
'Alice'	'Alpha'
'Bob'	'Gamma'
'Charlie'	'Beta'
'David'	'Delta'
'Emily'	<i>null</i>

8.

```
23  $\pi$  name, empid (  $\sigma$  empid != managerid (Employees  $\bowtie$  Departments))
24
25
```

▶ execute query



π name, empid (σ empid \neq managerid (_inlineRelation1 \bowtie _inlineRelation2))

Execution time: 5 ms

name	empid
'Charlie'	103
'David'	104