

Details

- Name : P K Navin Shrinivas
- Section : D
- SRN : PES2UG20CS237

A : Do a multiway join with atleast 3 tables.

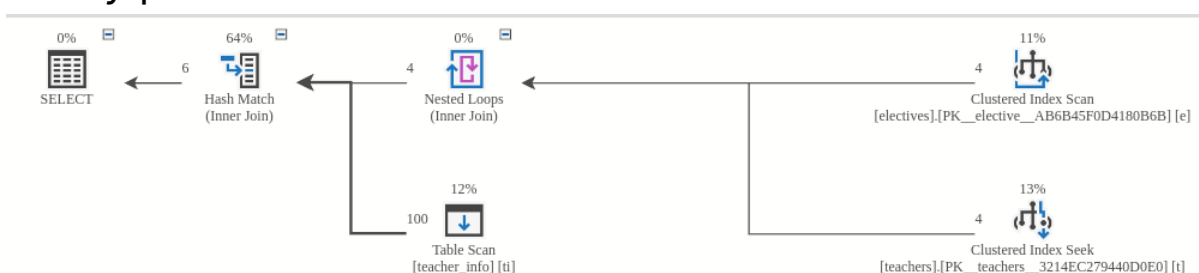
- First multiway join :

```
-- Find the address and name of the anchor teacher for  
all the electives :  
select e.elective_name,t.teacher_name,ti.address  
from electives as e join teachers as t ON e.anchor_ID =  
t.ID  
JOIN teacher_info as ti ON t.id = ti.ID;
```

- Output result :

	elective_name	teacher_name	address
1	DBT	Jinny	7 Boyd Drive
2	BD	Ellsworth	735 Bonner Hill
3	DBT	Jinny	4237 Forster Junction
4	BD	Ellsworth	13675 Carberry Pass

- Query plan :



- Cost : 0.01914442 (Total)

	Operation	Object	Estimated Cost %	Estimated Subtree...	Estimated Rows	Actual Rows	Average Row Size	Actual Executions	Estimated Executi...	Estimated CPU Cost	Actual CPU Cost	Estimated IO Cost	Estimi
1	Hash Match		63.95	0	6	4	60	1	1	0.0185412	0	0	369.23
2	Clustered Index Seek	[Electives].[dbo].[t...	12.96	0	1	4	34	4	4	0.0001581	0	0.003125	34
3	Table Scan	[Electives].[dbo].[t...	11.7	0	100	100	49	1	1	0.000267	0	0.003125	4900
4	Clustered Index Scan	[Electives].[dbo].[e...	11.33	0	4	4	34	1	1	0.0001614	0	0.003125	136
5	Nested Loops		0.06	0	4	4	46	1	1	0.00001672	0	0	184

- Second multiway join [4 tables]:

```
-- Find the teachers of the first electives that
students have selected
-- (Student_elective -> elective(anchor id) -> name of
teacher in teacher)
select
students.student_name,student_electives.first_elective,e
lectives.elective_name ,teachers.teacher_name
FROM students JOIN student_electives ON students.SRN =
student_electives.SRN
JOIN electives ON
student_electives.first_elective=electives.course_code
JOIN teachers ON teachers.ID = electives.anchor_ID;
```

- Result :

Results		Messages		
	student_name	first_elective	elective_name	teacher_name
1	Juanita	UE20CS496	DBT	Jinny
2	Kelcy	UE20CS496	DBT	Jinny
3	Kienan	UE20CS496	DBT	Jinny
4	Beret	UE20CS968	BD	Ellsworth
5	Hastie	UE20CS496	DBT	Jinny
6	Hendrika	UE20CS968	BD	Ellsworth
7	Ilario	UE20CS496	DBT	Jinny
8	Enid	UE20CS968	BD	Ellsworth
9	Vale	UE20CS968	BD	Ellsworth
10	Ron	UE20CS968	BD	Ellsworth
11	Elysee	UE20CS496	DBT	Jinny
12	Brenn	UE20CS968	BD	Ellsworth

- Cost of query : 0.01981252

	Operation	Object	Estimated Cost %	Estimated Subtree...	Estimated Rows	Average Row Size	Estimated Executi...	Estimated CPU Cost	Estimated IO Cost	Estimated Data Size	Parallel	Ordered
1	Clustered Index Seek	[Electives].[dbo].[s...	39.09	0	1	21	100	0.0001581	0.003125	21	false	true
2	Hash Match		38.47	0	100	59	1	0.0186332	0	5900	false	
3	Clustered Index Seek	[Electives].[dbo].[t...	7.76	0	1	21	4	0.0001581	0.003125	21	false	true
4	Table Scan	[Electives].[dbo].[s...	7	0	100	35	1	0.000267	0.003125	3500	false	false
5	Clustered Index Scan	[Electives].[dbo].[e...	6.78	0	4	45	1	0.0001614	0.003125	180	false	false
6	Nested Loops		0.86	0	100	56	1	0.000418	0	5600	false	
7	Nested Loops		0.03	0	4	44	1	0.00001672	0	176	false	

B : Changing join order

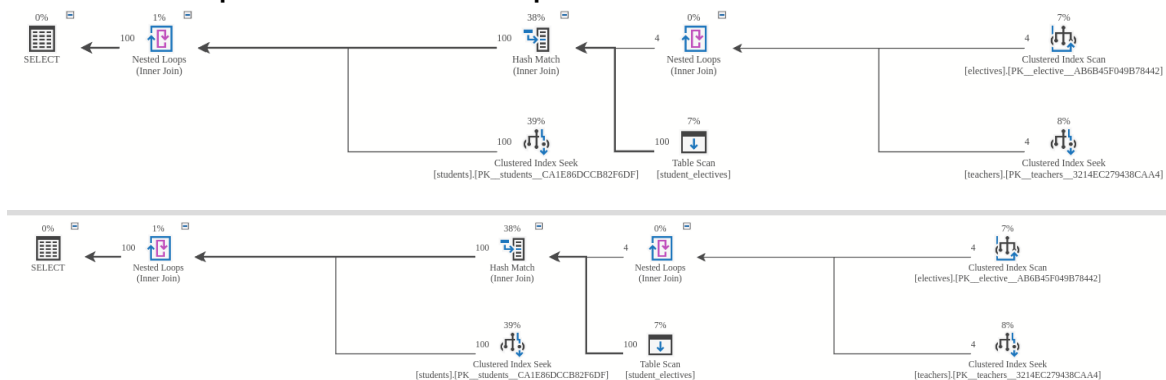
- Modifying the first join query,

```

select
students.student_name,student_electives.first_elective,e
lectives.elective_name ,teachers.teacher_name
FROM students LEFT OUTER JOIN student_electives ON
students.SRN = student_electives.SRN
JOIN electives ON
student_electives.first_elective=electives.course_code
JOIN teachers ON teachers.ID = electives.anchor_ID;

```

- Estimated plan and actual plan :



- Cost comparison :

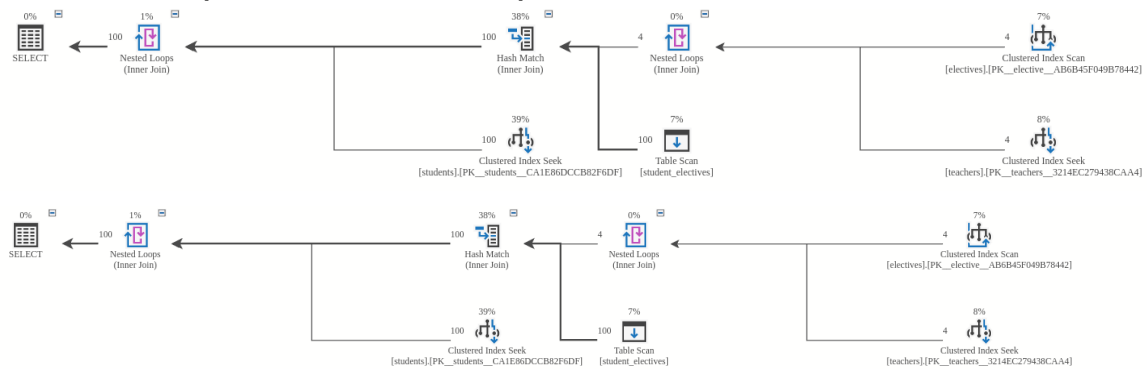
- Actual : 0.01981252
- Estimated : 0.01981252

They are the same!

- Another of the same join in different order :

```
select
students.student_name,student_electives.first_elective,e
lectives.elective_name ,teachers.teacher_name
FROM students JOIN student_electives ON students.SRN =
student_electives.SRN
JOIN electives ON student_electives.first_elective =
electives.course_code
JOIN teachers ON teachers.ID = electives.anchor_ID;
```

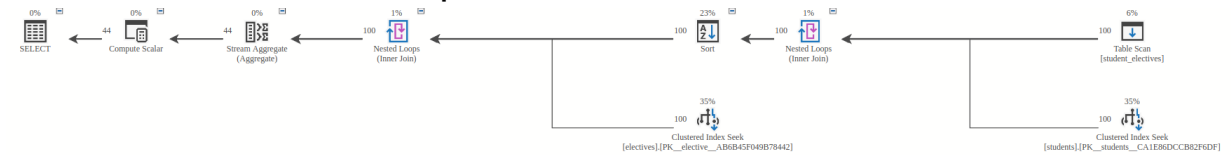
- Estimated plan and actual plan :



- Cost comparison :
 - Actual : 0.01981252
 - Estimated : 0.01981252
- A Join with subqueries, first order :

```
select section,elective_name,count(SRN) as
number_of_student_in_elective_in_this_class from
(select
students.SRN,section,first_elective,elective_name from
students
JOIN student_electives ON students.SRN =
student_electives.SRN
JOIN electives ON
student_electives.first_elective=electives.course_code)
AS temp group by section, first_elective,elective_name
order by section;
```

- Actual and estimated plan :



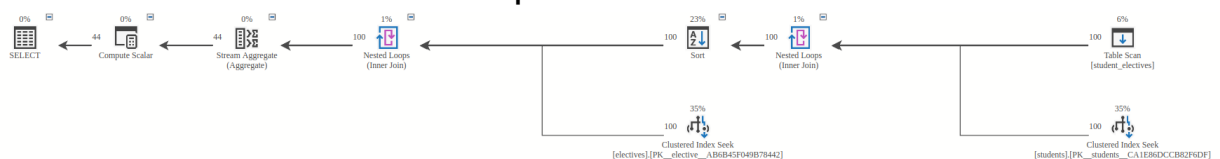
Operation	Object	Estimated Cost %	Estimated Subtree...	Estimated Rows	Average Row Size	Estimated Executi...	Estimated CPU Cost	Estimated IO Cost
SELECT		0	0.1					
Compute Scalar		0	0.1	44	26	1	0	0
Stream Aggregate		0.15	0.1	44	26	1	0.0000819799	0
Nested Loops		0.77	0.1	100	33	1	0.000418	0
Clustered Index Seek	[Electives].[dbo].[e...	34.69	0	1	21	100	0.0001581	0.003125
Sort		22.72	0	100	21	1	0.00113646	0.012613
Nested Loops		0.77	0	100	21	1	0.000418	0
Clustered Index Seek	[Electives].[dbo].[s...	34.69	0	1	9	100	0.0001581	0.003125
Table Scan	[Electives].[dbo].[s...	6.21	0	100	35	1	0.000267	0.003125

Operation	Object	Estimated Cost %	Estimated Subtree...	Estimated Rows	Actual Rows	Average Row Size	Actual Executions	Estimated Executi...	Estimated CPU Cost
Clustered Index Seek	[Electives].[dbo].[e...	34.69	0	1	100	21	100	100	0.0001581
Clustered Index Seek	[Electives].[dbo].[s...	34.69	0	1	100	9	100	100	0.0001581
Sort		22.72	0	100	100	21	1	1	0.00113646
Table Scan	[Electives].[dbo].[s...	6.21	0	100	100	35	1	1	0.000267
Nested Loops		0.77	0.1	100	100	33	1	1	0.000418
Nested Loops		0.77	0	100	100	21	1	1	0.000418
Stream Aggregate		0.15	0.1	44	43	26	1	1	0.0000819799
Compute Scalar		0	0.1	44		26		1	0

- Cost comparison :
 - Actual : 0.0026376399
 - estimated : 0.0026376399
- Join with second order :

```
select section,elective_name,count(SRN) as
number_of_student_in_elective_in_this_class from
(select
students.SRN,section,first_elective,elective_name from
electives
JOIN student_electives ON
student_electives.first_elective=electives.course_code
JOIN students ON students.SRN = student_electives.SRN)
AS temp group by section, first_elective,elective_name
order by section;
```

- Actual and estimated comparison :



	Operation	Object	Estimated Cost %	Estimated Subtree...	Estimated Rows	Average Row Size	Estimated Executi...	Estimated CPU Cost	Estimated IO Cost	Estimated Data Size
1	Clustered Index Seek	[Electives].[dbo].[e...	34.69	0	1	32	100	0.0001581	0.003125	32
2	Clustered Index Seek	[Electives].[dbo].[s...	34.69	0	1	9	100	0.0001581	0.003125	9
3	Sort		22.72	0	100	21	1	0.00113646	0.0112613	2100
4	Table Scan	[Electives].[dbo].[s...	6.21	0	100	35	1	0.000267	0.003125	3500
5	Nested Loops		0.77	0.1	100	44	1	0.000418	0	4400
6	Nested Loops		0.77	0	100	21	1	0.000418	0	2100
7	Stream Aggregate		0.15	0.1	44	26	1	0.0000819799	0	1142.9574
8	Compute Scalar		0	0.1	44	26	1	0	0	1142.9574

	Operation	Object	Estimated Cost %	Estimated Subtree...	Estimated Rows	Actual Rows	Average Row Size	Actual Executions	Estimated Executi...	Estimated CPU Cost
1	Clustered Index Seek	[Electives].[dbo].[e...	34.69	0	1	100	32	100	100	0.0001581
2	Clustered Index Seek	[Electives].[dbo].[s...	34.69	0	1	100	9	100	100	0.0001581
3	Sort		22.72	0	100	100	21	1	1	0.00113646
4	Table Scan	[Electives].[dbo].[s...	6.21	0	100	100	35	1	1	0.000267
5	Nested Loops		0.77	0.1	100	100	44	1	1	0.000418
6	Nested Loops		0.77	0	100	100	21	1	1	0.000418
7	Stream Aggregate		0.15	0.1	44	43	26	1	1	0.0000819799
8	Compute Scalar		0	0.1	44		26		1	0

- Output of the third join with sub queries :

	section	elective_name	number_of_student_in_elective_in_this_class
1	A	DBT	3
2	A	BD	4
3	C	DBT	3
4	C	BD	2
5	D	DBT	3
6	D	BD	2
7	E	DBT	1
8	E	BD	2
9	F	DBT	3
1...	F	BD	2

XML Showplan

1	<ShowPlanXML xmlns="http://...
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