
Query Cost

96 %

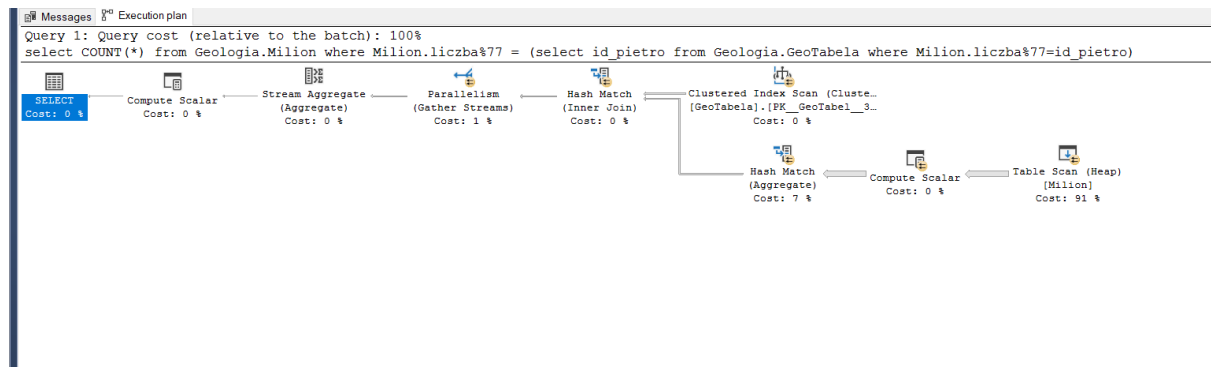
Messages Execution plan

Query 1: Query cost (relative to the batch): 100%

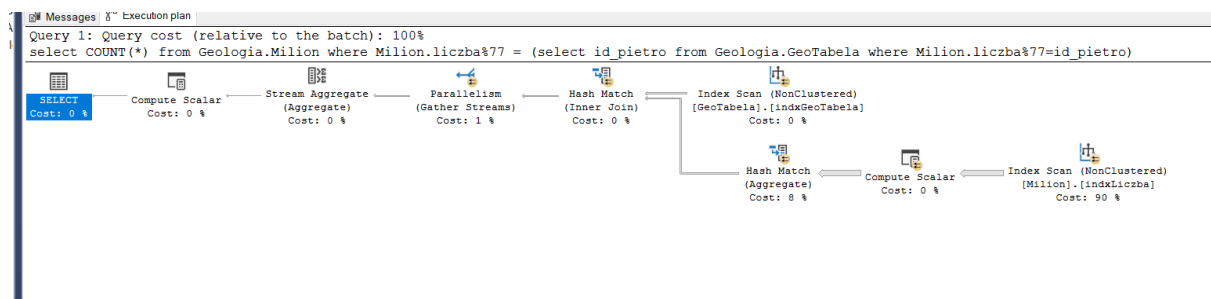
SELECT COUNT(*) FROM geologia.Milion INNER JOIN geologia.GeoTabela ON Milion.liczba%77 = GeoTabela.id_pietro

```
graph LR; SELECT[SELECT  
Cost: 0 %] --> CS1[Compute Scalar  
Cost: 0 %]; CS1 --> SA[Stream Aggregate  
(Aggregate)  
Cost: 0 %]; SA --> P[Parallelism  
(Gather Streams)  
Cost: 1 %]; P --> HM1[Hash Match  
(Inner Join)  
Cost: 0 %]; HM1 --> CISC[Clustered Index Scan (Clustered Index Scan)  
[GeoTabela].[PK_GeoTabela_3_]  
Cost: 0 %]; HM1 --> HM2[Hash Match  
(Aggregate)  
Cost: 7 %]; CISC --> TS[Table Scan (Heap)  
[Milion]  
Cost: 91 %]; CS2[Compute Scalar  
Cost: 0 %] --> HM2;
```

ZG3

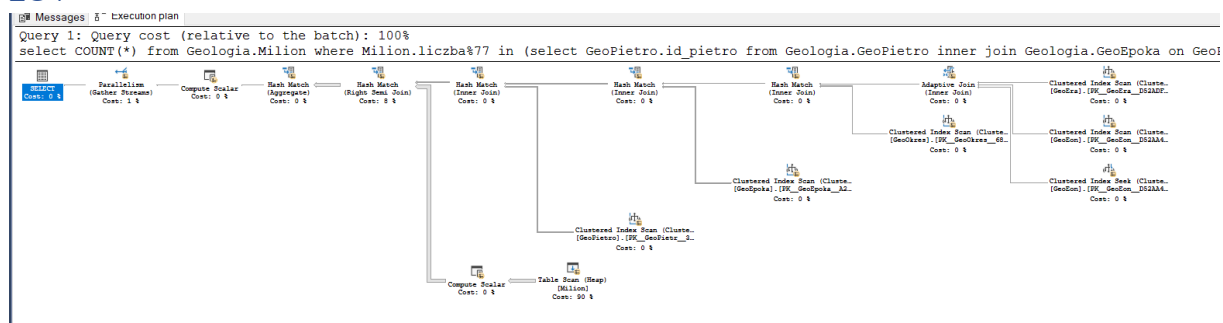


Rys. 4 Query cost: zapytanie trzecie bez indeksacji

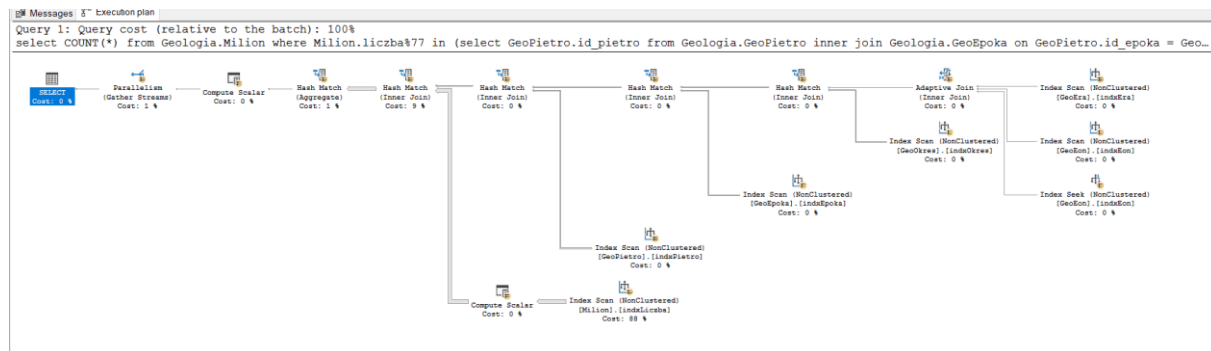


Rys. 5 Query cost: zapytanie trzecie z indeksacją

ZG4



Rys. 6 Query cost: zapytanie czwarte bez indeksacji



Rys. 7 Query cost: zapytanie czwarte z indeksacją

PostgreSQL

ZL1

```
250 EXPLAIN SELECT COUNT(*) FROM Milion WHERE mod(Milion.liczba,77)=
251 ((SELECT id_pietro FROM Geotabela WHERE mod(Milion.liczba,77)=(id_pietro)));
```

Data Output Explain Messages Notifications

QUERY PLAN	
text	
1	Finalize Aggregate (cost=14664.16..14664.17 rows=1 width=8)
2	-> Gather (cost=14663.95..14664.16 rows=2 width=8)
3	Workers Planned: 2
4	-> Partial Aggregate (cost=13663.95..13663.96 rows=1 width=8)
5	-> Hash Join (cost=2.73..13262.90 rows=160417 width=0)
6	Hash Cond: (mod(milion.liczba, 77) = geotabela.id_pietro)
7	-> Parallel Seq Scan on milion (cost=0.00..9572.67 rows=416667 width=4)
8	-> Hash (cost=1.77..1.77 rows=77 width=4)
9	-> Seq Scan on geotabela (cost=0.00..1.77 rows=77 width=4)

✓ Successfully run. Total query runtime: 53 msec. 9 rows affected.

Rys. 8 Query cost: zapytanie pierwsze bez indeksacji

QUERY PLAN
text
1 Finalize Aggregate (cost=14664.16..14664.17 rows=1 width=8)
2 -> Gather (cost=14663.95..14664.16 rows=2 width=8)
3 Workers Planned: 2
4 -> Partial Aggregate (cost=13663.95..13663.96 rows=1 width=8)
5 -> Hash Join (cost=2.73..13262.90 rows=160417 width=0)
6 Hash Cond: (mod(milion.liczba, 77) = geotabela.id_pietro)
7 -> Parallel Seq Scan on milion (cost=0.00..9572.67 rows=416667 width=4)
8 -> Hash (cost=1.77..1.77 rows=77 width=4)
9 -> Seq Scan on geotabela (cost=0.00..1.77 rows=77 width=4)

Rys. 9 Query cost: zapytanie pierwsze z indeksacją

ZL2

QUERY PLAN	
	text
1	Finalize Aggregate (cost=13946.92..13946.93 rows=1 width=8)
2	-> Gather (cost=13946.70..13946.91 rows=2 width=8)
3	Workers Planned: 2
4	-> Partial Aggregate (cost=12946.70..12946.71 rows=1 width=8)
5	-> Hash Join (cost=107.31..12545.66 rows=160417 width=0)
6	Hash Cond: (geoera.id_eon = geoeon.id_eon)
7	-> Hash Join (cost=80.66..12095.50 rows=160417 width=4)
8	Hash Cond: (geookres.id_era = geoera.id_era)
9	-> Hash Join (cost=54.68..11645.92 rows=160417 width=4)
10	Hash Cond: (geoepoka.id_okres = geookres.id_okres)
11	-> Hash Join (cost=28.71..11196.33 rows=160417 width=4)
12	Hash Cond: (geopietro.id_epoka = geoepoka.id_epoka)
13	-> Hash Join (cost=2.73..10746.75 rows=160417 width=4)
14	Hash Cond: (mod(million.iliczba, 77) = geopietro.id_pietro)
15	-> Parallel Seq Scan on milion (cost=0.00..9572.67 rows=416667 width=4)
16	-> Hash (cost=1.77..1.77 rows=77 width=8)
17	-> Seq Scan on geopietro (cost=0.00..1.77 rows=77 width=8)
18	-> Hash (cost=17.10..17.10 rows=710 width=8)
19	-> Seq Scan on geoepoka (cost=0.00..17.10 rows=710 width=8)
20	-> Hash (cost=17.10..17.10 rows=710 width=8)
21	-> Seq Scan on geookres (cost=0.00..17.10 rows=710 width=8)
22	-> Hash (cost=17.10..17.10 rows=710 width=8)
23	-> Seq Scan on geoera (cost=0.00..17.10 rows=710 width=8)
24	-> Hash (cost=17.40..17.40 rows=740 width=4)
25	-> Seq Scan on geoeon (cost=0.00..17.40 rows=740 width=4)

Rys. 10 Query cost: zapytanie drugie bez indeksacji

	QUERY PLAN
	text
1	Finalize Aggregate (cost=13912.92..13912.93 rows=1 width=8)
2	-> Gather (cost=13912.70..13912.91 rows=2 width=8)
3	Workers Planned: 2
4	-> Partial Aggregate (cost=12912.70..12912.71 rows=1 width=8)
5	-> Hash Join (cost=7.61..12511.66 rows=160417 width=0)
6	Hash Cond: (geopoka.id_okres = geookres.id_okres)
7	-> Hash Join (cost=4.23..11250.46 rows=160417 width=4)
8	Hash Cond: (geopietro.id_epoka = geopoka.id_epoka)
9	-> Hash Join (cost=2.73..10746.75 rows=160417 width=4)
10	Hash Cond: (mod(milion.liczba, 77) = geopietro.id_pietro)
11	-> Parallel Seq Scan on milion (cost=0.00..9572.67 rows=416667 width=4)
12	-> Hash (cost=1.77..1.77 rows=77 width=8)
13	-> Seq Scan on geopietro (cost=0.00..1.77 rows=77 width=8)
14	-> Hash (cost=1.22..1.22 rows=22 width=8)
15	-> Seq Scan on geopoka (cost=0.00..1.22 rows=22 width=8)
16	-> Hash (cost=3.27..3.27 rows=9 width=4)
17	-> Hash Join (cost=2.09..3.27 rows=9 width=4)
18	Hash Cond: (geoera.id_eon = geoeon.id_eon)
19	-> Hash Join (cost=1.07..2.19 rows=9 width=8)
20	Hash Cond: (geookres.id_era = geoera.id_era)
21	-> Seq Scan on geookres (cost=0.00..1.09 rows=9 width=8)
22	-> Hash (cost=1.03..1.03 rows=3 width=8)
23	-> Seq Scan on geoera (cost=0.00..1.03 rows=3 width=8)
24	-> Hash (cost=1.01..1.01 rows=1 width=4)
25	-> Seq Scan on geoeon (cost=0.00..1.01 rows=1 width=4)

Rys. 11 Query cost: zapytanie drugie z indeksacją

ZG3

	Data Output	Explain	Messages	Notifications
	QUERY PLAN			
	text			
1	Aggregate (cost=2175418.50..2175418.51 rows=1 width=8)			
2	-> Seq Scan on milion (cost=0.00..2175406.00 rows=5000 width=0)			
3	Filter: (mod(liczba, 77) = (SubPlan 1))			
4	SubPlan 1			
5	-> Seq Scan on geotabela (cost=0.00..2.16 rows=1 width=4)			
6	Filter: (mod(milion.liczba, 77) = id_pietro)			

Rys. 12 Query cost: zapytanie trzecie bez indeksacji

	QUERY PLAN text
1	Aggregate (cost=2175418.50..2175418.51 rows=1 width=8)
2	-> Seq Scan on milion (cost=0.00..2175406.00 rows=5000 width=0)
3	Filter: (mod(liczba, 77) = (SubPlan 1))
4	SubPlan 1
5	-> Seq Scan on geotabela (cost=0.00..2.16 rows=1 width=4)
6	Filter: (mod(milion.liczba, 77) = id_pietro)

Rys. 13 Query cost: zapytanie trzecie z indeksacją

ZG4

Data Output	Explain	Messages	Notifications
	QUERY PLAN text		
1	Finalize Aggregate (cost=12743.44..12743.45 rows=1 width=8)		
2	InitPlan 1 (returns \$3)		
3	-> Nested Loop (cost=3.18..82.01 rows=77 width=4)		
4	-> Nested Loop (cost=3.03..63.91 rows=77 width=8)		
5	-> Nested Loop (cost=2.88..45.81 rows=77 width=8)		
6	-> Hash Join (cost=2.73..27.70 rows=77 width=8)		
7	Hash Cond: (geopoka.id_epoka = geopietro.id_epoka)		
8	-> Seq Scan on geopoka (cost=0.00..17.10 rows=710 width=8)		
9	-> Hash (cost=1.77..1.77 rows=77 width=8)		
10	-> Seq Scan on geopietro (cost=0.00..1.77 rows=77 width=8)		
11	-> Index Scan using geookres_pkey on geookres (cost=0.15..0.24 rows=1 width=8)		
12	Index Cond: (id_okres = geopoka.id_okres)		
13	-> Index Scan using geoera_pkey on geoera (cost=0.15..0.24 rows=1 width=8)		
14	Index Cond: (id_era = geookres.id_era)		
15	-> Index Only Scan using geoeon_pkey on geoeon (cost=0.15..0.24 rows=1 width=4)		
16	Index Cond: (id_eon = geoera.id_eon)		
17	-> Gather (cost=12661.21..12661.42 rows=2 width=8)		
18	Workers Planned: 2		
19	Params Evaluated: \$3		
20	-> Partial Aggregate (cost=11661.21..11661.22 rows=1 width=8)		
21	-> Parallel Seq Scan on milion (cost=0.00..11656.00 rows=2083 width=0)		
22	Filter: (mod(liczba, 77) = \$3)		

Rys. 14 Query cost: zapytanie trzecie bez indeksacji

	QUERY PLAN	
	text	
1	Finalize Aggregate (cost=12668.93..12668.94 rows=1 width=8)	
2	InitPlan 1 (returns \$0)	
3	-> Hash Join (cost=4.88..7.50 rows=77 width=4)	
4	Hash Cond: (geoepoka.id_okres = geookres.id_okres)	
5	-> Hash Join (cost=1.50..3.51 rows=77 width=8)	
6	Hash Cond: (geopietro.id_epoka = geoepoka.id_epoka)	
7	-> Seq Scan on geopietro (cost=0.00..1.77 rows=77 width=8)	
8	-> Hash (cost=1.22..1.22 rows=22 width=8)	
9	-> Seq Scan on geoepoka (cost=0.00..1.22 rows=22 width=8)	
10	-> Hash (cost=3.27..3.27 rows=9 width=4)	
11	-> Hash Join (cost=2.09..3.27 rows=9 width=4)	
12	Hash Cond: (geoera.id_eon = geoeon.id_eon)	
13	-> Hash Join (cost=1.07..2.19 rows=9 width=8)	
14	Hash Cond: (geookres.id_era = geoera.id_era)	
15	-> Seq Scan on geookres (cost=0.00..1.09 rows=9 width=8)	
16	-> Hash (cost=1.03..1.03 rows=3 width=8)	
17	-> Seq Scan on geoera (cost=0.00..1.03 rows=3 width=8)	
18	-> Hash (cost=1.01..1.01 rows=1 width=4)	
19	-> Seq Scan on geoeon (cost=0.00..1.01 rows=1 width=4)	
20	-> Gather (cost=12661.21..12661.42 rows=2 width=8)	
21	Workers Planned: 2	
22	Params Evaluated: \$0	
23	-> Partial Aggregate (cost=11661.21..11661.22 rows=1 width=8)	
24	-> Parallel Seq Scan on million (cost=0.00..11656.00 rows=2083 width=0)	
25	Filter: (mod(liczba, 77) = \$0)	

Rys. 15 Query cost: zapytanie czwarte z indeksacją