

## DB Assignment 6

Sean Gor

10 December 2024

**Note:** ‘ ‘ = same as cell directly above it

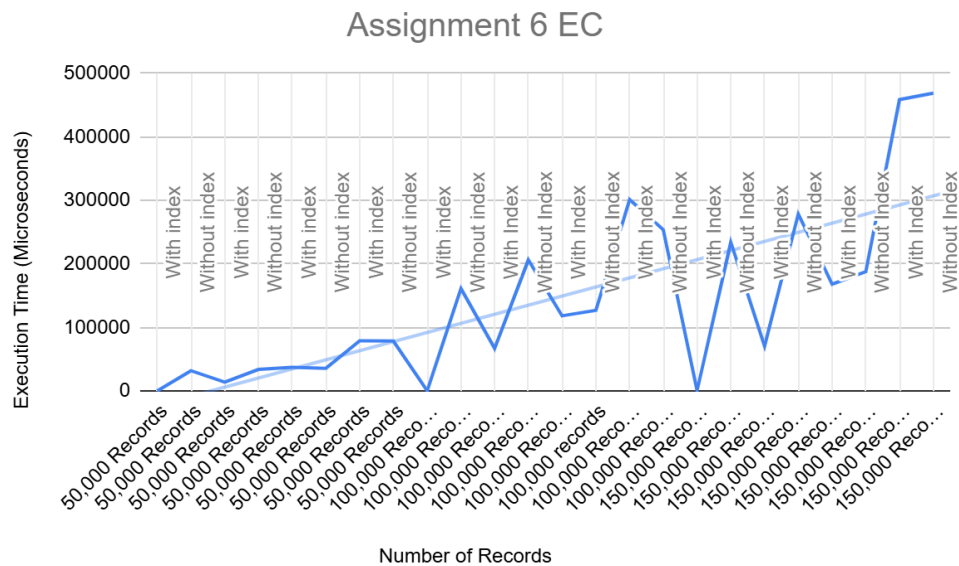
Query Type	Description	Dataset Size	Index Type	Time (microseconds)
Point Query 1	SELECT * FROM accounts WHERE branch_name = 'Downtown' AND balance = 50000	50,000 Records	With index	284.4
‘ ‘	‘ ‘	50,000 Records	Without index	31924.6
Point Query 2	SELECT * FROM accounts WHERE branch_name = 'Branch_12' AND account_type = 'Checking'	50,000 Records	With index	14092.1
‘ ‘	‘ ‘	50,000 Records	Without index	34008.1
Range Query 1	SELECT account_num from accounts where balance > 9000	50,000 Records	With index	37466.1
‘ ‘	‘ ‘	50,000 Records	Without index	35877.9
Range Query 2	SELECT account_num from accounts where balance > 9000	50,000 Records	With index	79234.4
‘ ‘	‘ ‘	50,000 Records	Without index	78709.4
Point Query 1	SELECT * FROM accounts WHERE	100,000 Records	With index	406.7

Query Type	Description	Dataset Size	Index Type	Time (microseconds)
	branch_name = 'Downtown' AND balance = 50000			
‘ ‘	‘ ‘	100,000 Records	Without index	161289.2
Point Query 2	SELECT * FROM accounts WHERE branch_name = 'Branch_12' AND account_type = 'Checking'	100,000 Records	With Index	67058.2
‘ ‘	‘ ‘	100,000 Records	Without Index	206365.2
Range Query 1	SELECT account_num from accounts where balance > 9000	100,000 Records	With Index	118341.8
‘ ‘	‘ ‘	100,000 records	Without Index	127184.1
Range Query 2	SELECT * from accounts where balance > 8000 and balance < 25000	100,000 Records	With Index	301260.3
‘ ‘	‘ ‘	100,000 Records	Without Index	253826.4
Point Query 1	SELECT * FROM accounts WHERE branch_name = 'Downtown' AND balance = 50000	150,000 Records	With Index	850.5
‘ ‘	‘ ‘	150,000 Records	Without Index	234378.1
Point Query 2	SELECT * FROM accounts	150,000 Records	With Index	70671.8

Query Type	Description	Dataset Size	Index Type	Time (microseconds)
	WHERE branch_name = 'Branch_12' AND account_type = 'Checking'			
‘ ‘	‘ ‘	150,000 Records	Without Index	278648.5
Range Query 1	SELECT account_num from accounts where balance > 9000	150,000 Records	With Index	168282.3
‘ ‘	‘ ‘	150,000 Records	Without Index	187870.2
Range Query 2	SELECT * from accounts where balance > 8000 and balance < 25000	150,000 Records	With Index	458627.4
‘ ‘	‘ ‘	150,000 Records	Without Index	468865.3

Overall, I was not surprised by much of my data. I noticed a significant difference between the times with larger queries (150,000 records) and smaller queries (50,000 records). I observed that the first point query with an index took only fewer than 1000 microseconds. This occurred for each of my data sizes. In general, execution times did change when indices were added/removed; however, some stayed the same, and only 1 or 2 timing procedures included a larger time with an index than without an index. These anomalies in my experiment could be due to the specific query itself or to other in-machine factors. In general, though, my results indicate sufficient evidence to determine that indices can help to speed up the query process.

## Plotted Timing Results:



Overall, there is an upward trend based on the amount of records and the execution time. It is also important to note that there are “spikes” in my graph. This is probably due to the fact that columns without an index take more time (in general) than columns with one, and my graph vacillates between a query with and without an index. Analogous to my table, there is a huge downward spike when the graph hits point query 1, because in my timing experiment, all point 1 queries with indices resulted in very little time. The line of best fit shown indicates that indeed, there was a general positive correlation between the number of records and the execution time.