



**BRENT OZAR**  
UNLIMITED®

## Lab 1: Dedupe & Eliminate Indexes

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## Just like real life...

Our end users are yelling at us to make it go faster.

I'm doing the best I can to fend them off.

We don't wanna make changes to production unless we can prove it'll make things better.

When you wanna change something:

- Ask my permission first in Slack  
(In *#BrentOzarUnlimited* – no direct messages)
- Explain what you want to change, and why



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## What I've assigned you to do

1. Analyze StackOverflow's indexes, then Dedupe & Eliminate them
2. Script out the changes you want to make (but only focus on reducing index counts for now – don't add more indexes yet)
3. Ask your lead DBA for approval



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## To do it, we need running loads.

If we're going to Eliminate unused indexes, then we need real workloads using some of the indexes.

(This is also why tools like `sp_BlitzIndex` don't work very well in development & offline environments: none of the indexes are really getting used.)



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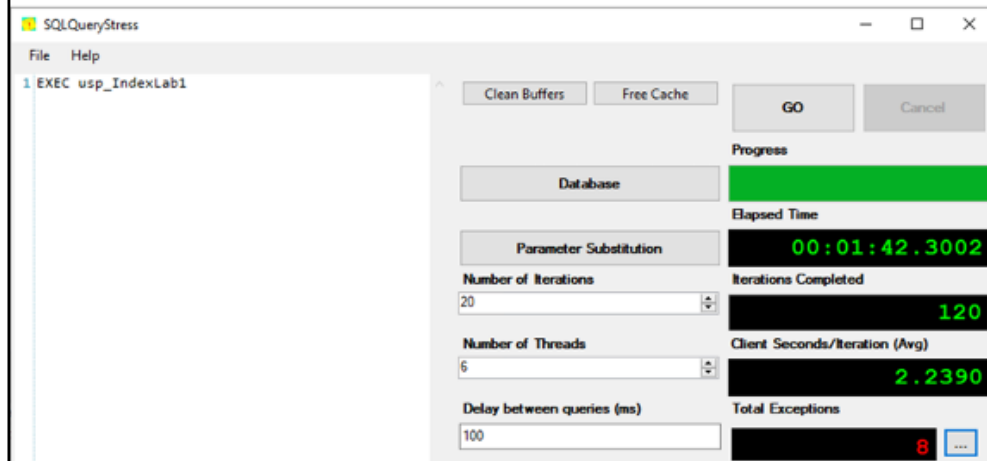
## **Labs 1, 2, & 3 use the same SQL:**

1. If you've been playing around adding/dropping indexes, restore your StackOverflow database
2. Copy & run the setup script for Lab 1
3. Start SQLQueryStress:
  1. File Explorer, \Labs, double-click SQLQueryStress.exe
  2. Click File, Open, \Labs\IndexLab1.json
  3. Click Go



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# What SQLQueryStress is



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**A few errors are okay.  
100% error rate is not.**

**OK errors:**

- Divide by zero
- Transaction count
- Deadlock

**But if you get errors about  
procs not being found or  
syntax errors, stop and ask  
for help, include screenshots.**

Progress	
Database	<div></div>
Elapsed Time	00:01:42.3002
Parameter Substitution	
Number of Iterations	Iterations Completed
20	120
Number of Threads	Client Seconds/Iteration (Avg)
6	2.2390
Delay between queries (ms)	Total Exceptions
100	8



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## You can stop it at any time.

You don't need the queries running live as you work for labs 1-3. (Lab 4 will be different.)

Click Cancel on SQLQueryStress whenever you want: you don't have to wait for it to finish the lab.

Just let it run for at least 5-10 minutes to build up data in your index usage DMVs.

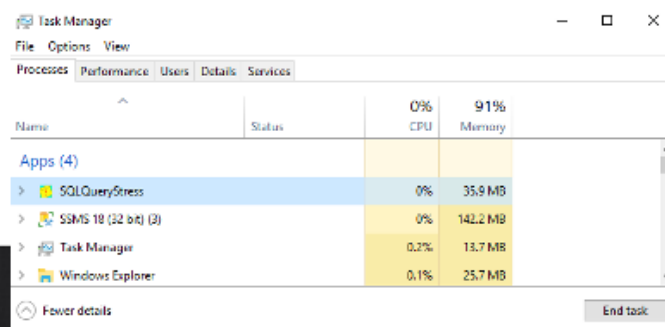


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## Sometimes, it goes rogue.

Sometimes you'll cancel it and close it, but it will keep running in the background, headless.

Go into Task Manager to make sure it's not there.  
If it is, end-task it a couple of times to kill it.



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## How I'd budget these 2 hours

**5 minutes – poke around:** run `sp_BlitzIndex`, pick the first table you want to focus on tuning.

**15 minutes – analyze 1 table:** focus on it, script out all of the changes that you want to make at once (not just one index - I'm a busy manager), then ask approval.

Repeat that a couple/few of times for 3-4 tables, and give me a recap of your space/index savings.

**60 minutes – lunch.**



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## Format for your homework

```
/* 2019-11-29: Hi! Now, you smell much better today, even across Slack. Not nearly as bad as yesterday. */

I reviewed the Users table, and we need to drop these indexes because they're not getting used: */
DROP INDEX IX_DisplayName ON dbo.Users;
DROP INDEX IX_LastAccessDate ON dbo.Users;
DROP INDEX IX_ID4 ON dbo.Users;
GO

/* In case things go wrong, here's an undo script:
CREATE INDEX IX_DisplayName ON dbo.Users(DisplayName);
CREATE INDEX IX_LastAccessDate ON dbo.Users(LastAccessDate);
CREATE INDEX IX_ID4 ON dbo.Users(Id);

This index is a narrower subset of IX_LocationWebsiteUrl, so we should drop it: */
DROP INDEX IX_Location ON dbo.Users;
GO

/* In case things go wrong, here's an undo script:
CREATE INDEX IX_Location ON dbo.Users(Location);

I'd like to merge these two indexes together into one:

CREATE INDEX IX_Reputation_Includes ON dbo.Users(Reputation) INCLUDE (LastAccessDate);
CREATE INDEX IX_Reputation_Location ON dbo.Users(Reputation, Location);

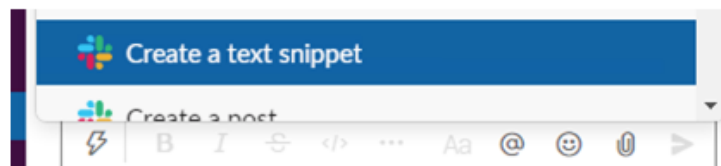
Into this one: */
CREATE INDEX IX_Reputation_Location_Includes ON dbo.Users(Reputation, Location) INCLUDE (LastAccessDate);
GO

/* And get rid of those above two afterwards: */
DROP INDEX IX_Reputation_Includes ON dbo.Users;
DROP INDEX IX_Reputation_Location ON dbo.Users;
GO
```

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## To turn in your homework

Click the lightning bolt, then Create a text snippet.



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## Stumped? Take a peek at Slack.

The Slack room lets you see:

- Other peoples' answers
- How quick (or slow) you are compared to them
- How thorough you are compared to them
- Who you should cheat off of during the final exam



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## What to expect

The workload won't finish faster:  
the D/E parts are about clearing away  
dead weight so we can make things  
faster in the A/T/H steps.

(Sometimes D/E does actually speed  
things up, like when you have blocking  
contention – but we'll get to that in a  
later lab.)



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## If you're using one of my VMs

Email me at [Help@BrentOzar.com](mailto:Help@BrentOzar.com).

If you don't email me, we'll turn off your VM today because we'll assume you didn't show up for class.



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