Optimising Queries and the JET ShowPlan

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https://isladogs.co.uk/speed-comparison-tests-8/

Access Europe
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AccessUserGroups.org

Optimising Queries and the JET ShowPlan

Comparative Speed Tests

➢ **Avoid domain functions**

➢ **Use appropriate joins on suitable fields**

➢ **Correct use of indexes on search fields and joins**

➢ **Use native JET functions in place of VBA functions**

➢ **WHERE vs HAVING**

➢ **First vs GROUP BY**

Available Tools

➢ **JET ShowPlan – view query execution plans**

➢ **ISAM Stats – view disk reads/writes**

Optimising Queries and the JET ShowPlan

AIM: Compare & analyse speed tests on queries which:

➢ **get the count of each type of pastoral incident recorded in the year 2018 for every student born in 2005**
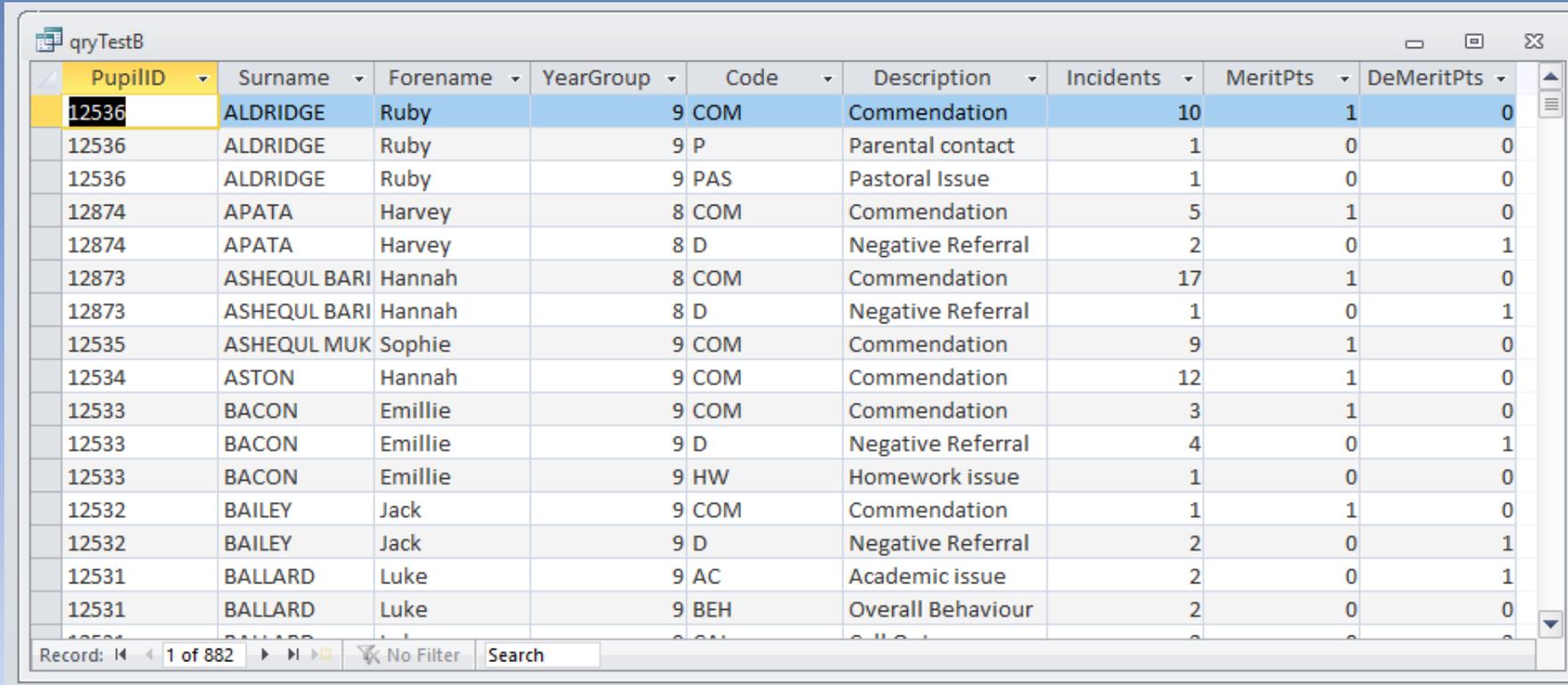
PupilID	Surname	Forename	YearGroup	Code	Description	Incidents	MeritPts	DeMeritPts
12536	ALDRIDGE	Ruby	9	COM	Commendation	10	1	0
12536	ALDRIDGE	Ruby	9	P	Parental contact	1	0	0
12536	ALDRIDGE	Ruby	9	PAS	Pastoral Issue	1	0	0
12874	APATA	Harvey	8	COM	Commendation	5	1	0
12874	APATA	Harvey	8	D	Negative Referral	2	0	1
12873	ASHEQUL BARI	Hannah	8	COM	Commendation	17	1	0
12873	ASHEQUL BARI	Hannah	8	D	Negative Referral	1	0	1
12535	ASHEQUL MUK	Sophie	9	COM	Commendation	9	1	0
12534	ASTON	Hannah	9	COM	Commendation	12	1	0
12533	BACON	Emillie	9	COM	Commendation	3	1	0
12533	BACON	Emillie	9	D	Negative Referral	4	0	1
12533	BACON	Emillie	9	HW	Homework issue	1	0	0
12532	BAILEY	Jack	9	COM	Commendation	1	1	0
12532	BAILEY	Jack	9	D	Negative Referral	2	0	1
12531	BALLARD	Luke	9	AC	Academic issue	2	0	1
12531	BALLARD	Luke	9	BEH	Overall Behaviour	2	0	0

qryTestB

Record: 1 of 882   No Filter   Search

2010

365

JET ShowPlan

- ➢ **Undocumented feature – little known but available since at least 2000**
- ➢ **New registry key - location depends on Access version & bitness e.g.**
  - ❖ **HKLM\SOFTWARE\Microsoft\Office\ClickToRun\REGISTRY\MACHINE\Software\Wow6432Node\ Microsoft\Office\16.0\Access Connectivity Engine\Engines\Debug\JETSHOWPLAN**
- ➢ **Can be set from Access if Run as an Administrator**
- ➢ **JET ShowPlan Manager add-in makes setting up easy**
- ➢ **When feature enabled, query execution plans are added to text file showplan.out – normally in the default database directory**

- ➢ **Understanding showplan.out:**
  - ❖ **GOOD – index ; rushmore**
  - ❖ **BAD – scanning ; X-prod ; temp ; temporary**
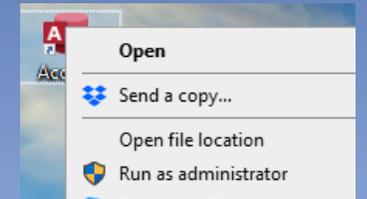
ISAMStats

➢ **ISAM = Indexed Sequential Access Method**

➢ **Measures disk activity during query execution**
  ❖ **Reads/Writes/CacheReads/Locks**

```
Reads          : 18
Writes         : 12
CacheReads     : 24176
ReadAheadReads : 0
LocksPlaced    : 16
LocksReleased  : 12
```

➢ **Undocumented feature – available up to A2010**

➢ **Almost no information available so rarely used – 'deactivated' A2013**

➢ **Hidden member of DAO library**
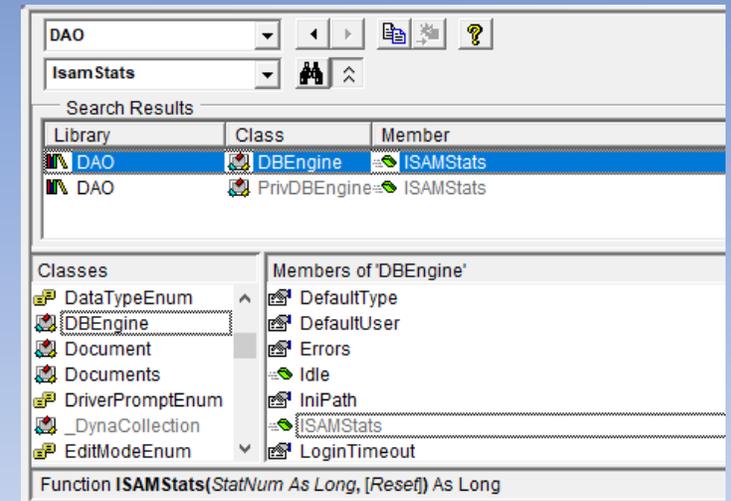
Useful Links

Optimising Queries:

➢ **https://isladogs.co.uk/speed-comparison-tests-8/**

➢ **http://allenbrowne.com/QueryPerfIssue.html**

➢ **https://isladogs.co.uk/speed-comparison-tests-4/** **(HAVING vs WHERE)**

JET ShowPlan:

➢ **https://isladogs.co.uk/show-plan-go-faster/**

➢ **https://isladogs.co.uk/jet-showplan-manager-addin/**

➢ **https://nolongerset.com/jetshowplan-a-primer/**

ISAM Stats:

➢ **Access 2000 Developers Handbook – Volume 1 Chapter 15**

Optimising Queries and the JET ShowPlan

Quiz Time

Which is faster . . . and why?

Please turn on your microphones to take part

Quiz Time

Which is faster and why? A or B

➤ **A**

SELECT query with indexes on joins and search fields

➤ **B**

SELECT query with no indexes on joins and search fields

A:

Access uses the indexes rather than checking each record individually

Up to 250 x faster in my tests (especially on large datasets)

https://www.isladogs.co.uk/speed-comparison-tests-7/

Quiz Time

Which is faster and why? A or B

➢ **A**

SELECT ClientID, Surname & ", " + FirstName AS FullName
FROM tblClient
ORDER BY Surname & ", " & FirstName;

➢ **B**

SELECT ClientID, Surname & ", " + FirstName AS FullName
FROM tblClient
ORDER BY Surname, FirstName, ClientID;

B:

Allows use of indexes on the sort fields

Quiz Time

Which is faster and why? A or B

➤ **A**

SELECT StudentID, Surname , FirstName, DOB
FROM tblStudents
WHERE (DOB>= #1/1/2008#) AND (DOB< #1/1/2009#)

➤ **B**

SELECT StudentID, Surname , FirstName, DOB
FROM tblStudents
WHERE Year(DOB) = 2008;

A:
Allows use of indexes on the filter fields

Quiz Time

Which is faster and why? A or B

➢ **A**

UPDATE query with indexes on joins and search fields

➢ **B**

UPDATE query with no indexes on joins and search fields

B:

Where indexes used, these have to be updated as well

Updating indexes can take up to 50% longer in my tests

https://www.isladogs.co.uk/speed-comparison-tests-7/

Quiz Time

Which is faster and why? A or B

➢ **A**

SELECT ClientID, Count(InvoiceID) AS HowMany
FROM tblInvoice
GROUP BY ClientID
HAVING ClientID = 99;

➢ **B**

SELECT ClientID, Count(InvoiceID) AS HowMany
FROM tblInvoice
WHERE ClientID = 99
GROUP BY ClientID;

B:

WHERE before count / HAVING after . . . providing field indexes are used

Quiz Time

Which is faster and why? A or B

➢ **A**

SELECT EmployeeID, LastName, Notes
FROM Employees
GROUP BY EmployeeID, LastName, Notes;

➢ **B**

SELECT EmployeeID, First(LastName) AS Last_Name, First(Notes) AS Note
FROM Employees
GROUP BY EmployeeID;

B:

Group by one unique field & return values from first record of each

Quiz Time

Which is faster and why? A or B

➢ **A**

Using Stacked Queries

➢ **B**

Using a Subquery

A: (probably)

Subqueries are less efficient and usually slower

Quiz Time

Which is faster and why? A or B

➤ **A**

    Using separate APPEND and UPDATE queries

➤ **B**

    Using a combined UPSERT (AKA UPEND) query

B (probably)

Depends on the number of records to be appended / updated

See https://www.isladogs.co.uk/upend-query/

Quiz Time

Which is faster and why? A or B

> ## A

Running queries with JET ShowPlan ON

> ## B

Running queries with JET ShowPlan OFF

B:

Creating the ShowPlan.out file can add up to 14% to execution time
Use JET ShowPlan as a diagnostic tool then disable it

Quiz Time

Which is fastest and why? A, B or C

➢ **A**

   Using saved queries

➢ **B**

   Using SQL statements in VBA

➢ **C**

   Using query defs

It depends . . .

See: https://isladogs.co.uk/speed-comparison-tests-6

Quiz Time

Which is faster? A or B

➤ **A**

Access BE

➤ **B**

SQL Server BE

It depends . . .

Optimising SQL Server is a subject for another future session