

Getting into scripting with IDEA

How we introduced standard CAATs into our audit work



Boring preamble

- Some IT background / interest.
- Probably a familiar scenario: small team and one or two people more technically minded.
- Tried to encourage a have-a-go mentality so that colleagues are comfortable with IDEA and Excel.
- Which frees me up to do some of the more specialised stuff.





Fraud & Enforcement Data Hub

Stuart.Denyer ([Home Panel](#) / [Search](#) / [Documents](#) / [Users](#) / [Log Out](#))

no user input for 0 minutes and 20 seconds
after 10 minutes you will be logged out

SEARCH > Details of searches / reports are logged. Information held here should only be accessed under [DPA Schedule 2](#) exemption or similar legislation.

Data sets [select all](#) / [clear](#)

- council tax (190,502)
- business rates (13,857)
- benefit claims current (58,488)
- housing benefit landlords (6,922)
- housing tenants (26,234)
- housing applicants (4,701)
- housing purchase apps (20,631)
- housing garage tenants (2,059)
- electoral rolls (1,044,383)
- employees (17,769)

[\[+\] show more](#) [about this data](#)

Name Address / Postcode DOB (YYYYMMDD)

NINO Telephone Bank details

Full text search Please enter a reference for your search (eg "XYZ investigation")

- include inactive records where available
- highlight possible enforcement matches
- but ignore DOB-only enforcement matches



Background with IDEA

- Colleague had developed some initial scripts.
- Getting direct access to databases streamlined our use a great deal.
- Make friends with other people in the organisation who use reporting tools against databases.



Authority

- Most of you are auditors.
- Build on access you have already.
- Depending on the type of data you want to work with, do your homework on legal gateways.
- Make friends with Information Governance staff.



IDEA pros and cons

- Pro: IDEA is particularly useful for taking a total population and performing various tasks on it such as extractions and aggregations; eg splitting activity on a budget code into pay/non-pay + income / expenditure codes or ranking most-used suppliers.
- Con: It's more hassle to add procedures to an IDEAScript than to change a line or two of SQL if you have additional reporting requirements.



IDEA pros and cons

- Pro: Some IDEA functions are much more efficient than writing pure SQL queries, particularly things like duplicate detection and gap analysis.
- Con: Identifying duplicates or gaps, and other more "specialist" tasks such as stratifying a sample or joining two tables visually are also quite simple to achieve in Excel / MS Query, which everyone already has.



IDEA pros and cons

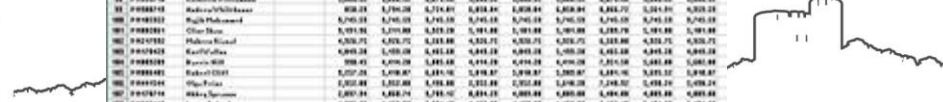
- Pro: Being able to add interfaces means that less confident staff can use point and click scripts.
- Con: Using point and click scripts means that staff tend to forget how to use the business systems themselves.
- Additionally, you're likely to be the only person who can fix things if they don't work.



Some highlights

- Importing full data sets and checking those back to source systems.
- Let IDEA read the contents, build the SQL query and match against the results.

The screenshot shows an Excel spreadsheet with a grid of data. The columns are labeled with letters A through Z, and the rows are numbered 1 through 1000. The data appears to be a list of items with associated numerical values, possibly representing a catalog or inventory. The interface includes the standard Excel ribbon (File, Home, Insert, Page Layout, Formulas, Data, Review) and a formula bar showing the value '10959'.



Payroll Analysis

Please ensure that you've set a clean working folder before using this script, then enter dates and drill down to the required org unit code from the browser below. Selecting a code that contains many other codes may be

Export spreadsheets from generated reports once they've finished running

Start Date (yyyy-mm-dd) End Date (yyyy-mm-dd)

Date to begin taking recent payments from (yyyy-mm-dd)

ACADEMIES & TRADED SERVICE SCHOOLS [34459400ia] - 12 below
 ADDITIONAL SERVICES [62634200ib] - 3 below
 DMBC LEAVERS [6808744gkV]
 DMBC PENSIONERS PAYMENTS [85014600ib]
 DMBC VOLUNTEERS [15517600ib] - 5 below
 DUDLEY METROPOLITAN BOROUGH COUNCIL [88926700iZ] - 5 below
 ELECTIONS [84571200ib]
 LEAVERS [09329600ig]
 MEMBERS [48250000ib]

< Company < Org Above Drill Down >

Extract an Establishment List using the details entered above.

Run DBS checks on the Establishment List matching on Surname, Initial, I

Run other HR reports (eg starters and leavers).

Compare payments on one or more cost centres with the Establishment L
 Cost centres need to be enclosed in single quote marks like

Compare a safeguarding spreadsheet with the Establishment List, matchi
 Surname, Initial, DOB. To prepare this for IDEA, paste your data (in the order forename, surname, DOB) without column headings into a new Excel document and save it as a CSV file

GO

- Simple visual interface to allow users to drill down into the organisation hierarchy.
- Also shows downside of building interfaces with IDEA – this was created on Win 7.



But...

- Start simple.
- Automate what you can.
- Enable testing larger samples.
- Anything else that adds value to work – particularly if you can do things with IDEA that can't easily be done in a business system or without going to IT.
- If you can, start with where the money is.



General tips

- Write an index/library script – i.e. a library.iss that can be bound to the IDEA ribbon/toolbar and which presents a window with buttons to launch other IDEA scripts with `Client.RunIDEAScript + path`.
- If working with a limited pool of licences, once your script completes and has generated output to spreadsheets, ask the user if they need to leave IDEA open and if not quit.



General tips

- Change one thing at a time.
- Write code so that you can reuse it.
- IDEAScript is very close to VBA or VBScript, and you can adapt a lot of existing code based on that.
- You can also create functions for use in IDEA itself.



```

Function Replace(SourceString As String, SearchString As String, ReplaceString As String, CaseSensitive As Boolean)
' adapted from http://www.exceltip.com/st/Replace\_text\_in\_a\_text\_file\_using\_VBA\_in\_Microsoft\_Excel/494.html
Dim p As Integer, NewString As String, use1 As String, use2 As String
Do
If CaseSensitive = True Then
    use1=SourceString
    use2=SearchString
Else
    use1=UCase(SourceString)
    use2=UCase(SearchString)
End If
p = InStr(p + 1, use1, use2)
If p > 0 Then ' replace
    NewString = ""
    If p > 1 Then NewString = Mid(SourceString, 1, p - 1)
    NewString = NewString + ReplaceString
    NewString = NewString + Mid(SourceString, p + Len(SearchString), Len(SourceString))
    p = p + Len(ReplaceString) - 1
    SourceString = NewString
End If
If p >= Len(NewString) Then p = 0
Loop Until p = 0
Replace = SourceString
End Function

```



General tips

- Build and test database queries using “normal” tools such as SQL Server Management Studio or <https://portableapps.com/apps/development/database-browser-portable>
- ODBC has quirks – eg SET NOCOUNT ON;
- Make friends with people who have documentation on the databases you’re using.
- Business Objects is often a useful starting point.



General tips

- If matching between systems there are obvious common identifiers such as UPRN or NINO, but if you don't have any, consider making them:
- J_SMIT (first initial plus first few letters of surname)
- 10_DY11HF (number plus postcode minus spaces)
- IDEA has some text handling functions, and I'll link some additional custom functions for working with Regular Expressions in a minute.



IDEA wishlist

- Make educational/demo copies more available.
- Watching the introduction of Python with interest.
- Invest in making scripting of interfaces easier.
- Improve regular expression support.



Free resources

- <http://virtualdebris.co.uk/blog/032B00BC/a-couple-of-idea-regex-functions-and-some-simple-code-snippets>
- <http://virtualdebris.co.uk/blog/0332A15A/familiarising-with-sql-server-environments--sql-from-crystal-reports>
- <http://virtualdebris.co.uk/blog/0358B3CC/fraud-and-audit-type-analysis-techniques-using-microsoft-excel>
- <http://virtualdebris.co.uk/blog/035ECCD0/some-sql-server-functions-for-string-matching>
- https://portableapps.com/apps/development/database_browser_portable
- https://en.wikipedia.org/wiki/Regular_expression / <https://xkcd.com/208/>



Official resources

- Application help files!
- <https://support.casewareanalytics.com/>
- <http://www.ideascripting.com/>
- Mastering IDEAScript: The Definitive Guide (2011)
<https://www.amazon.co.uk/dp/1118004485/>



Questions and a request

- I'd like to steal your ideas: what you've done, what you'd like to do, what you think adds value.
- Here's one if you're in a local authority: every month or so match new entries on the electoral roll (use UPRN if you can, summarise how many entries there are per address) and compare that with council tax accounts that receiving single person discount.

