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# D360 Test Automation Tool

# D360 Test Automation Tool

Background:

- Ongoing Certara internal effort around automated testing of D360
- ***UGM attendees requested help with upgrading to new versions, specifically around testing***

Strategy:

- Provide a mechanism for Certara ***and customers*** to more easily test a new version of D360

Larger Strategy:

- Provide a extensible admin tool that supports bulk operations on D360 objects

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# D360 Test Automation Tool

- ***Testing Strategies***
  - The Test Automation Tool supports several types of testing.
  - Start with the simpler testing approaches, and then build up to the more complex testing.

- ***Smoke Testing***
  - Ensure that common operations work as expected.
  - Useful for new deploys and configuration changes.
  - Any errors are logged for later review.
- ***Functional Testing***
  - More complete testing, but tool eliminates the need for any manual operations, other than visual inspection of results.
  - Screenshots of the resulting datasets, can be easily reviewed.
  - The complete dataset files can be opened and reviewed if needed.
- ***Regression Testing***
  - Detailed comparison of results against expected (or “master”) results, either from another D360 server, or from an earlier run of the Test Automation Tool.
  - Difference are logged by the tool.
  - Requires precise queries and stable data in order to avoid false failures.

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# D360 Test Automation Tool

**Query List Filter**

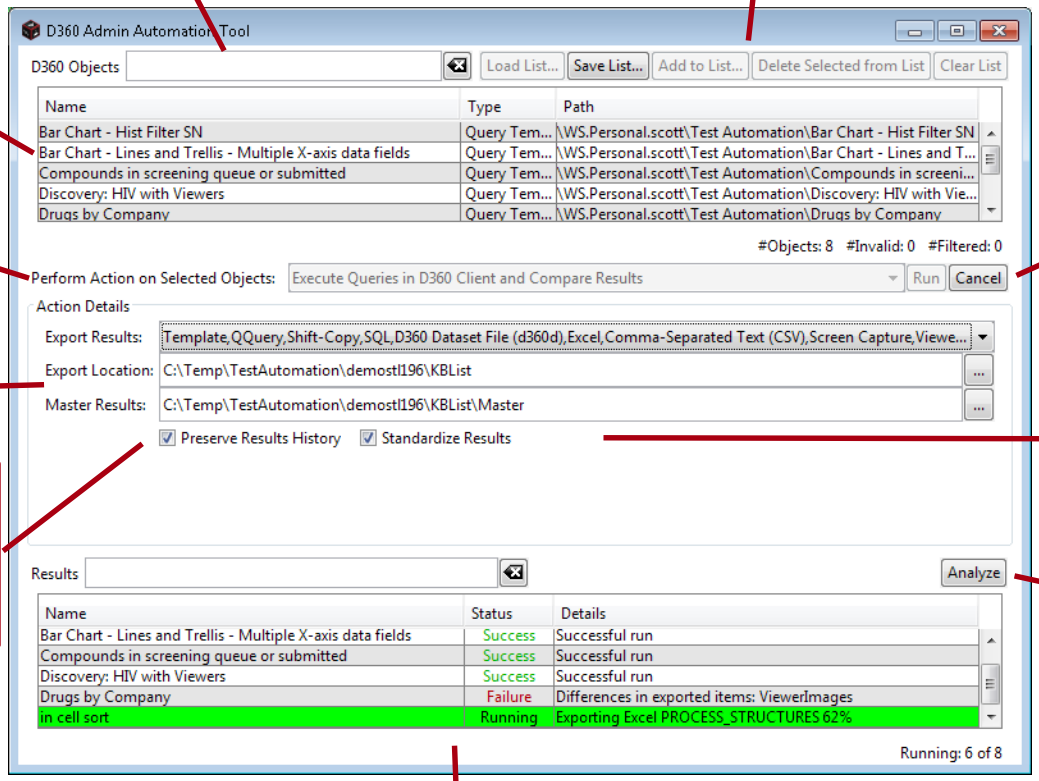
**Query List Operaters**

**Query List**

**Action Selector**

**Action Details**

**Preserve Results History**
Track result history by date and time




**Action Controls**

**Standardize Results**
Eliminate unimportant differences (e.g. data order)

**Analyze Result History**
View results of multiple runs over time

**Action Results**
Results of the Action on each query in the list

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# Use Case 1 – Smoke Testing the D360 Server

- In the simplest scenario, want to run hundreds of queries (with minimal effort) and verify no anomolies.
- Only current “automated” option is Scheduled Queries
  - Works, but not optimal
  - Can be inconvenient to set up for 10’s/100’s of queries
  - May require server restarts to restart the SQ’s
  - Might interfere with users SQ’s
- DEMO

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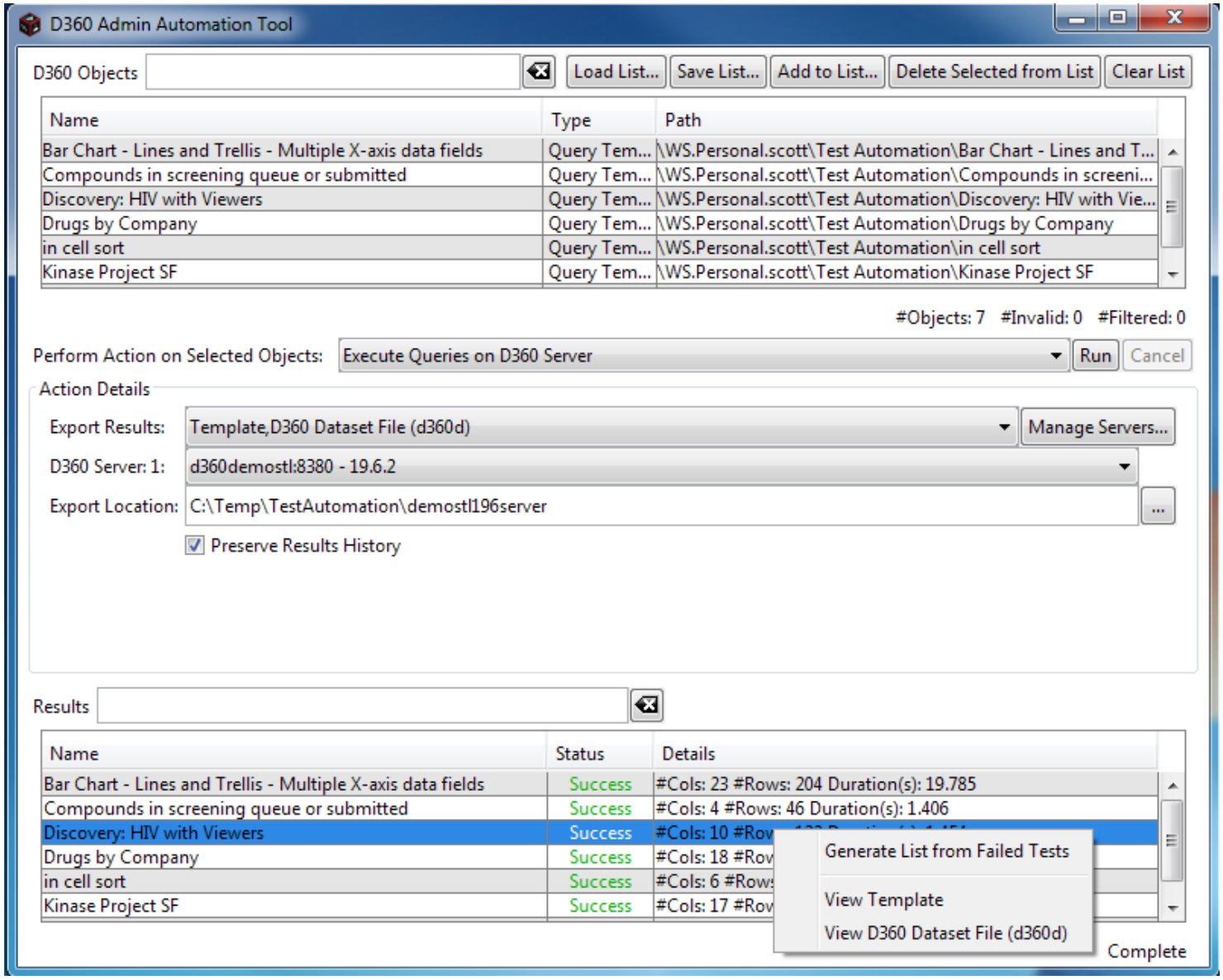
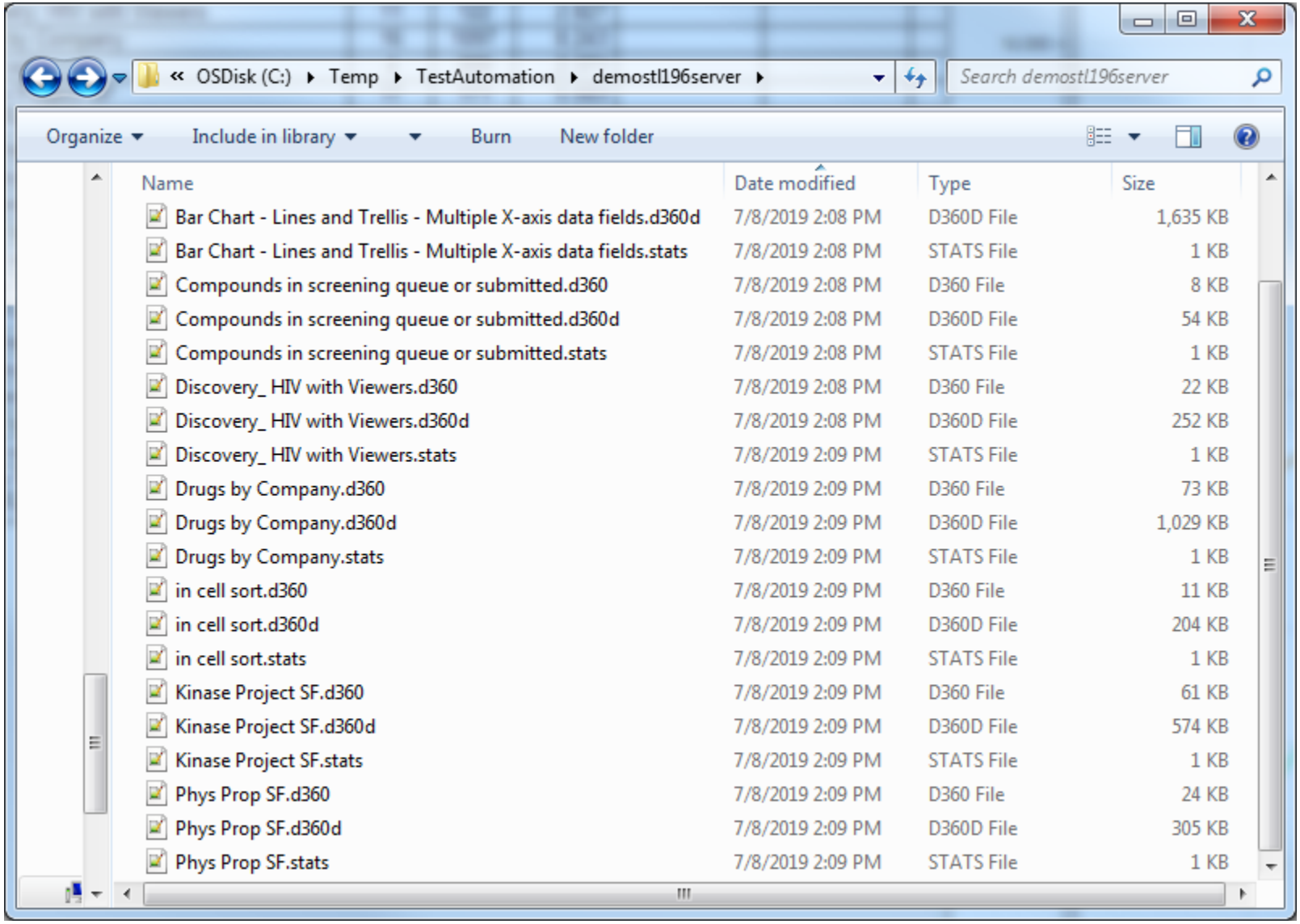
# Use Case 1 – Smoke Testing the D360 Server



# Use Case 1 – Smoke Testing the D360 Server

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# Use Case 1 – Smoke Testing the D360 Server

- DEMO

- ***With 19.6 Test Automation Tool***
  - ***Can easily run an arbitrary list of queries on the server, unattended, anytime of day, without interfering with users SQs.***

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# Use Case 2 – Functional Testing of the D360 Client

- Only option currently is running the D360 client and repeatedly opening and running N queries
  - Requires a person
  - Manual, and can be tedious
  - Can be time consuming (depending on query speed)

- DEMO

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# Use Case 2 – Exporting Results

- **The Test Automation Tool supports exportiing various files types as part of query execution:**
  - **Microsoft Excel**
  - **Comma Separated Values (CSV)**
  - **Spotfire CSV – Comma delimited file, suitable for easy import into Spotfire**
  - **Tab Separate Values (TSV)**
  - **D360 Template – Original D360 query**
  - **D360 Dataset – Full D360 Dataset, including data and visualizations**
  - **Screen Capture – Full screenshot of the complete D360 query and macro results**
  - **Viewer Images - Screenshot of each individual D360 view**
  - **Template – D360 spreadsheet or form query template**
  - **SQL - SQL based on QQuery and Shift-Copy details**
  - **QQuery - D360 internal basic query definition**
  - **Shift-Copy – D360 internal metadata for query columns**

- **Preserve Results History**
- The “Preserve Results History” option will force the creation of a separate output folder for each execution, with a folder name including the D360 version plus date and time.

- **Standardize Results**
- D360 datasets will sometimes display data in different (row order from run to run. This is as expected and is due to the fact the underlying relational database(s) do not return data in a defined order, but can be misleading when reviewing results. Using the “Standardize Results” option, the Test Automation tool will automatically sort the resulting data set. The data will be sorted by the category key for the query in ascending order.

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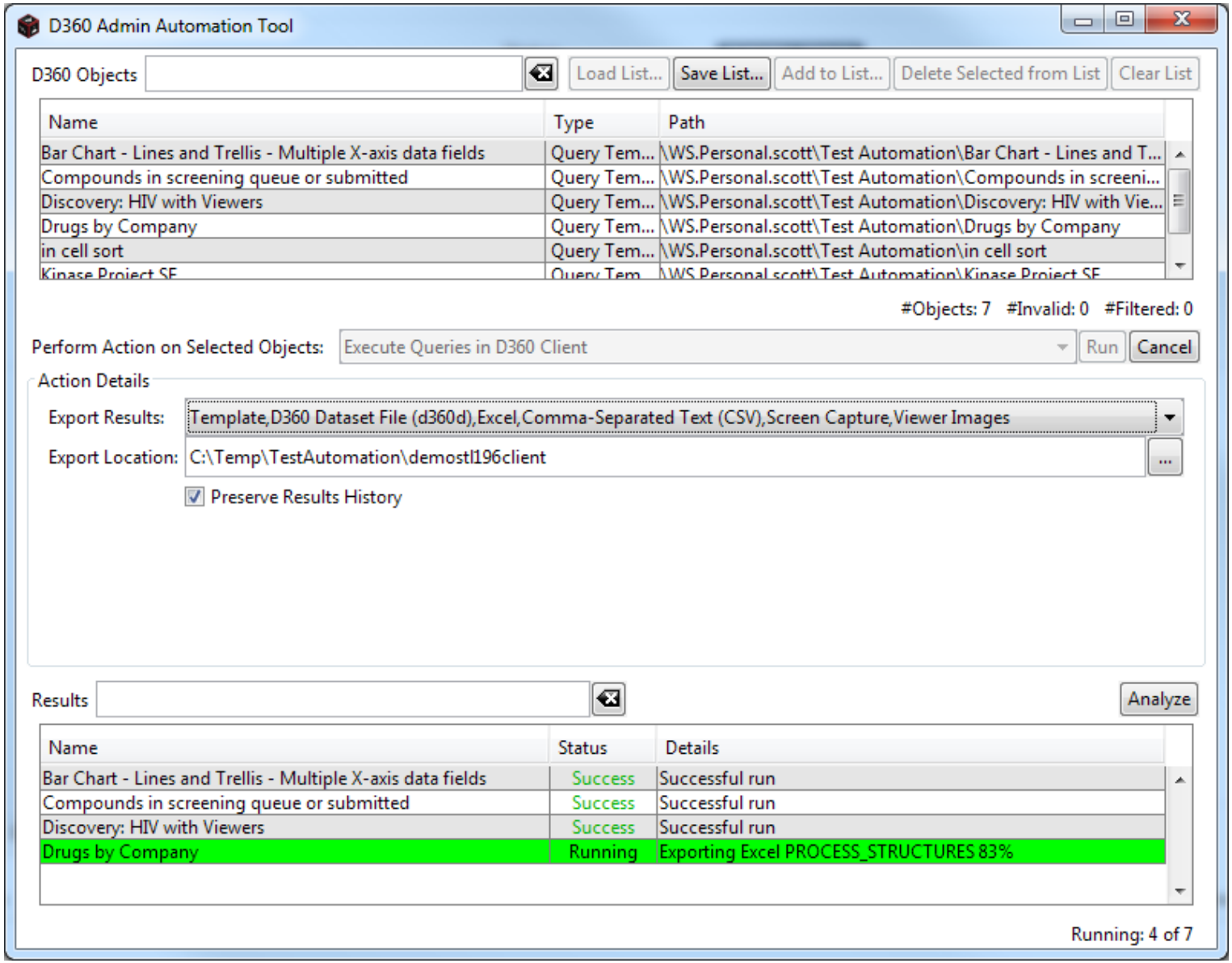
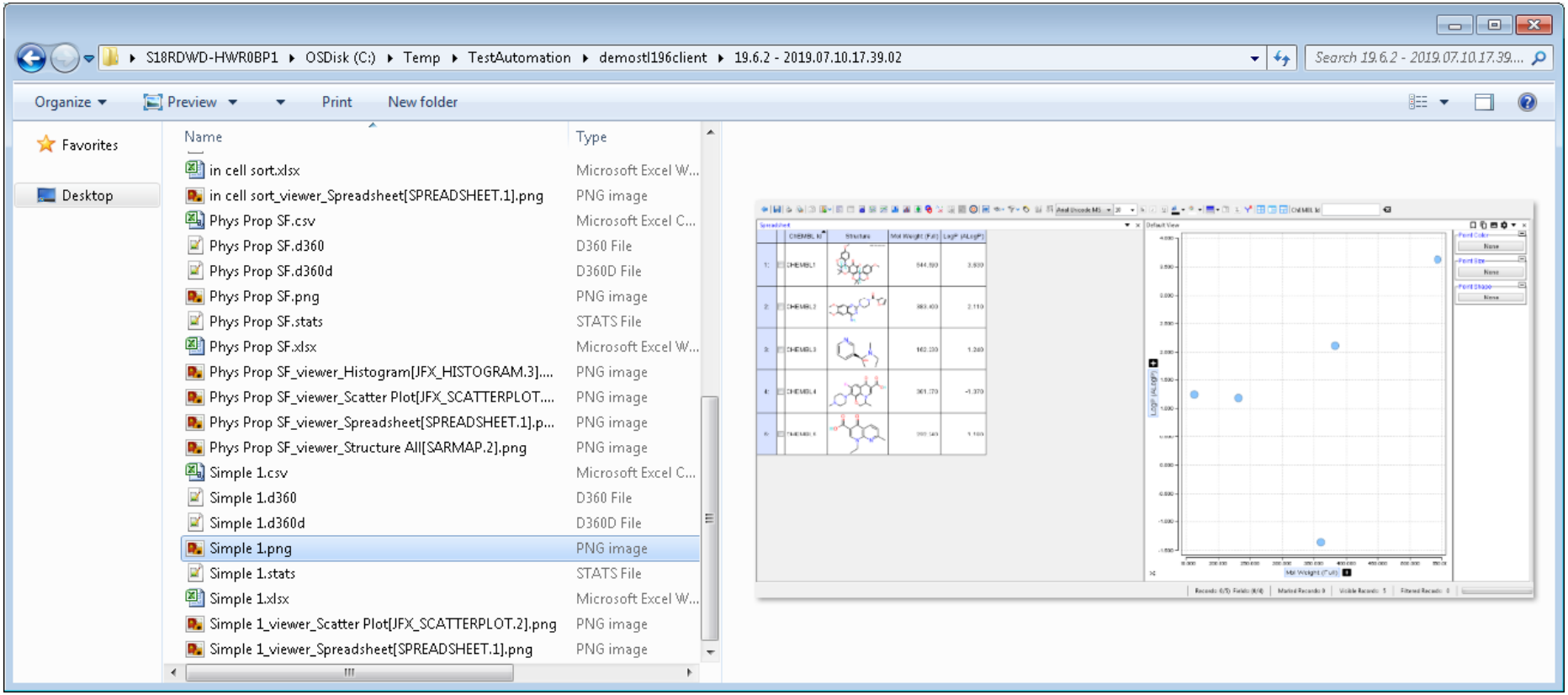
# Use Case 2 – Functional Testing of the D360 Client



# Use Case 2 – Functional Testing of the D360 Client

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# Use Case 2 – Functional Testing of the D360 Client

- DEMO

- *With 19.6 Test Automation*
  - *Can easily run an arbitrary list of queries **in the client**, unattended, anytime of day, and **quickly review the results** later, **including visualizations.***

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# Use Case 3 – Regression Testing

- Confirm that results are as exactly as expected.
  - Usually involves comparing results from the new D360 version against results from the current D360 production deploy
- Only option currently is for a human to manually look at the output from the old and new versions.

- DEMO

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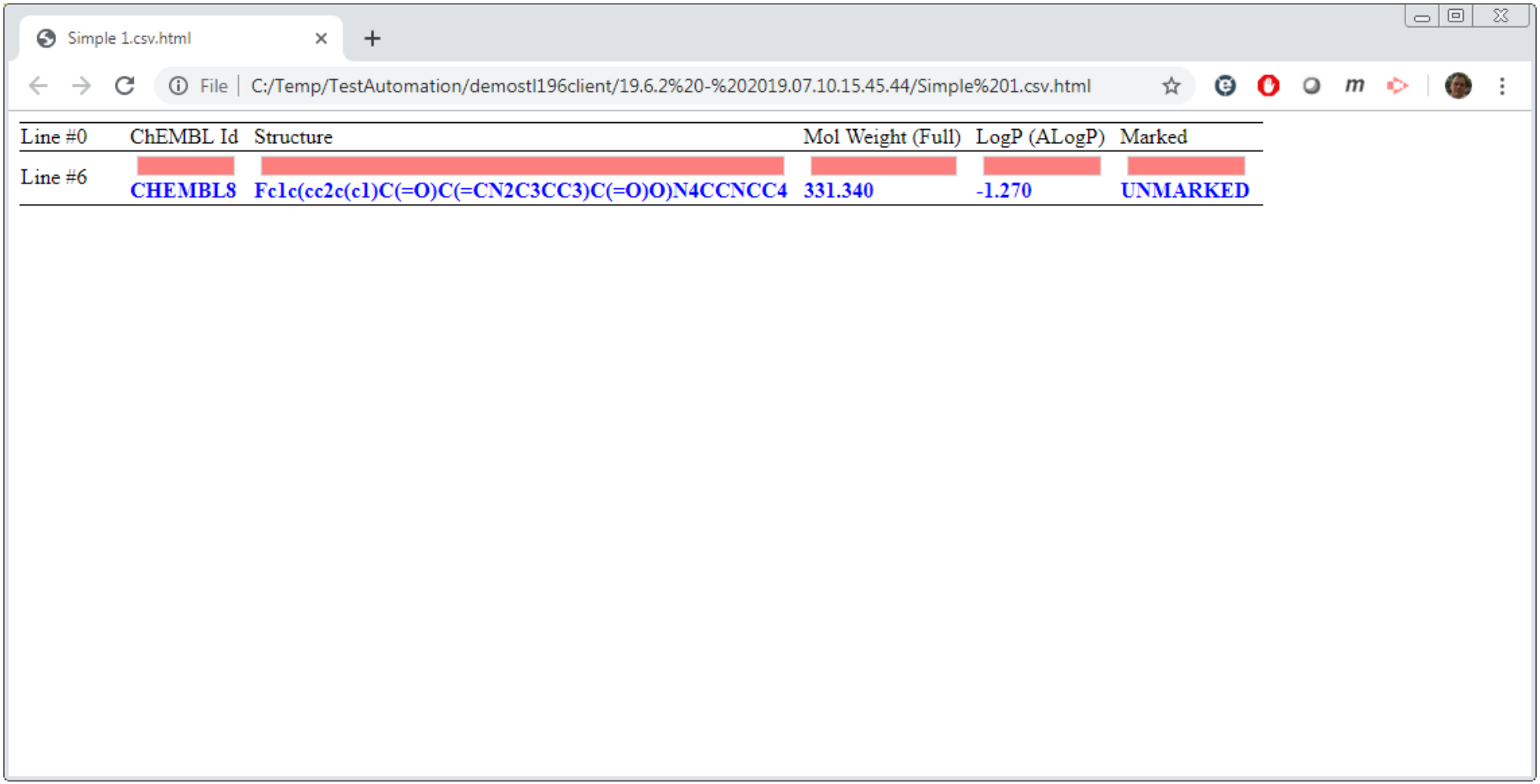
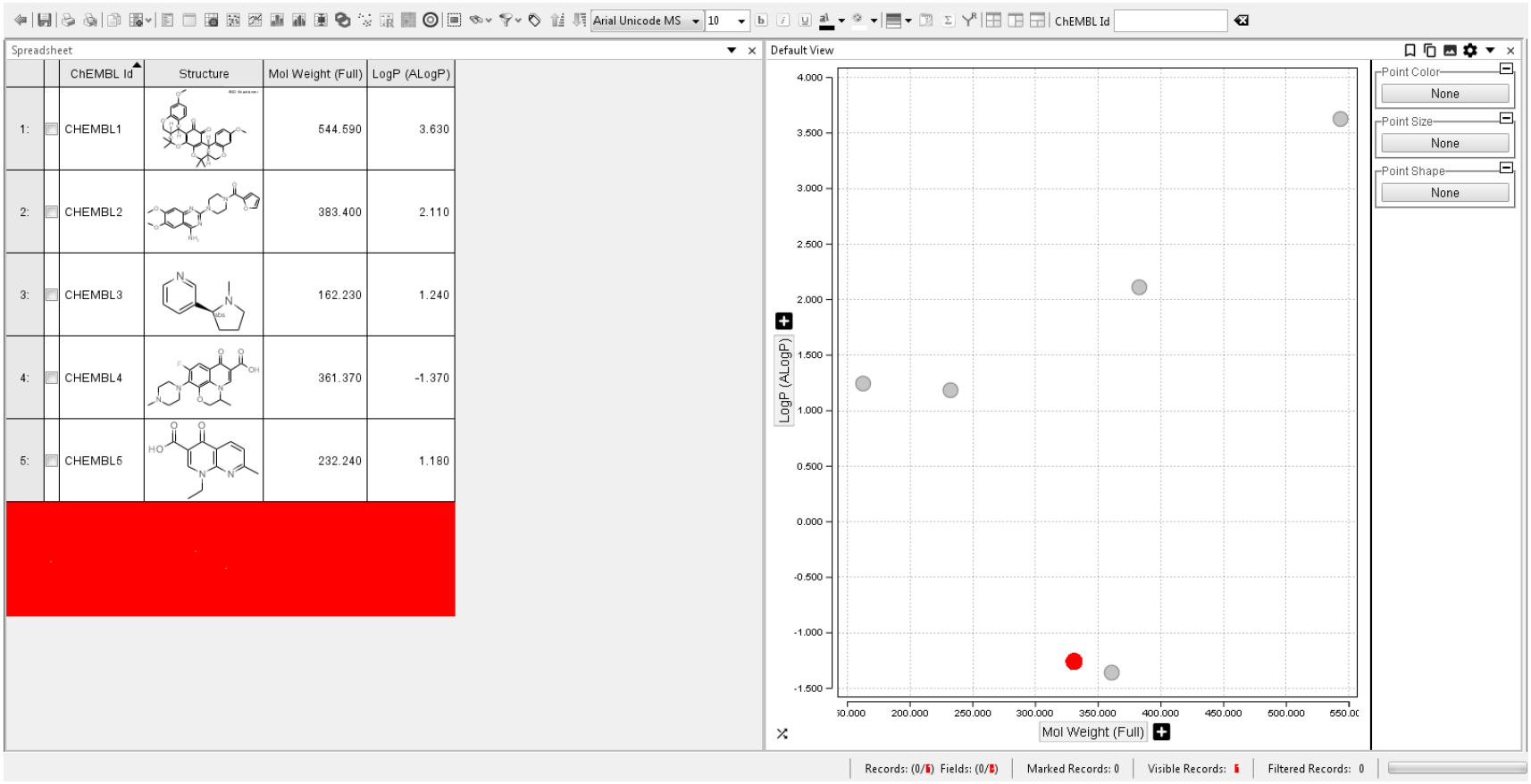
# Use Case 3 – CSV Compare

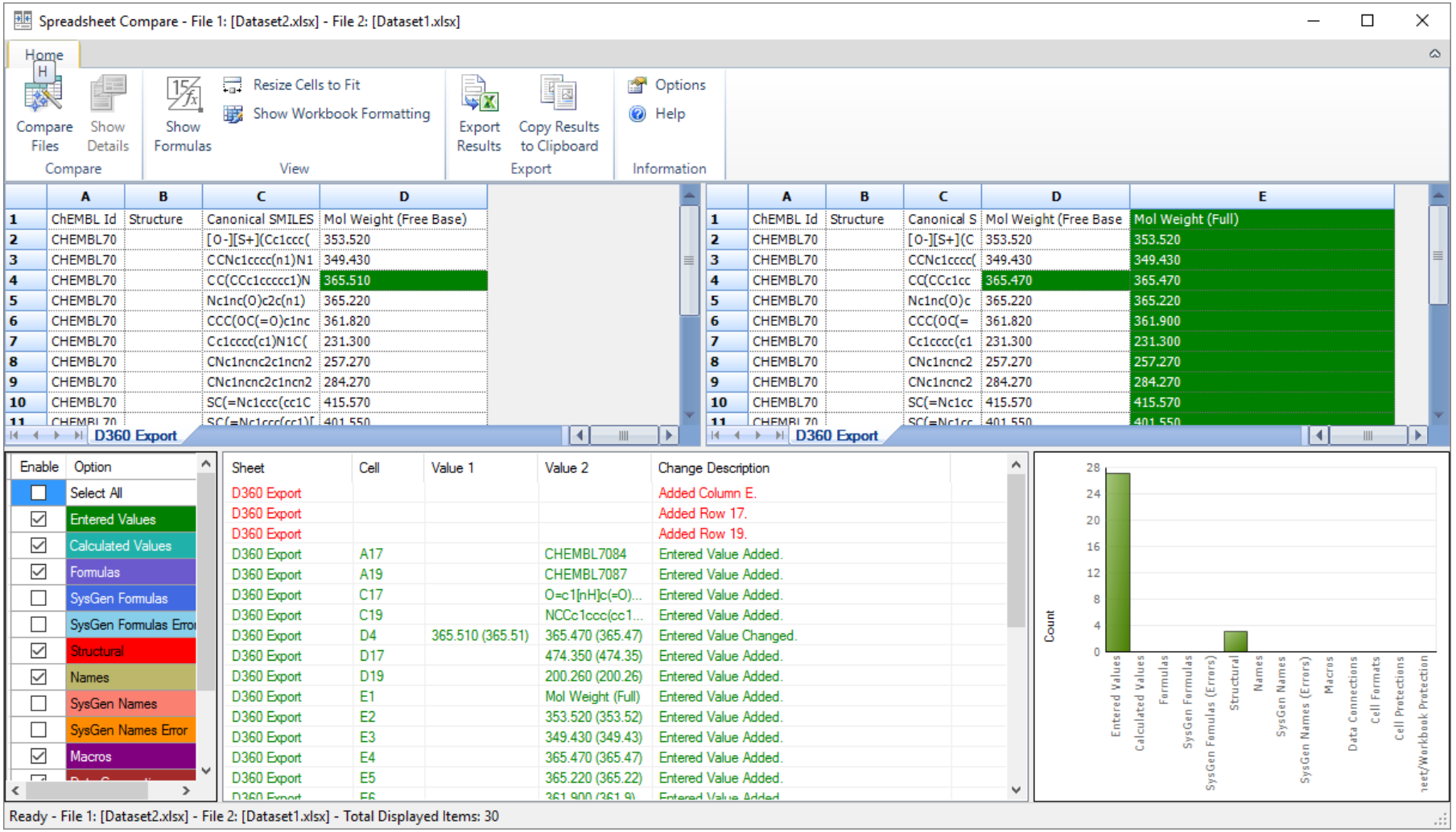



| Line # | ChEMBL Id | Structure | Mol Weight (Full) | LogP (ALogP) | Marked |
|---|---|---|---|---|---|
| Line #6 | CHEMBL8 | Fc1c(cc2c(c1)C(=O)C(=CN2C3CC3)C(=O)O)N4CCNCC4 | 331.340 | -1.270 | UNMARKED |

# Use Case 3 – Screenshot Compare



# Use Case 3 – Excel Spreadsheet Compare

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# Use Case 3 – Regression Testing

- DEMO

- *With 19.6 Test Automation*
  - *Can easily run an arbitrary list of queries in the client, unattended, anytime of day, and quickly review the results later, including visualizations,* ***and automatically compare the results against an expected set of results.***

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# Use Case 4 – Performance/Trends

- “Is query performance stable over time?”
- “I added an index to a database table.  Did it help?”

- DEMO

- *With 19.6 Test Automation*
  - *Can easily run an arbitrary list of queries in the client, unattended, anytime of day, and quickly review the results later, including visualizations, and automatically compare the results against an expected set of results,* ***and analyze results over time.***

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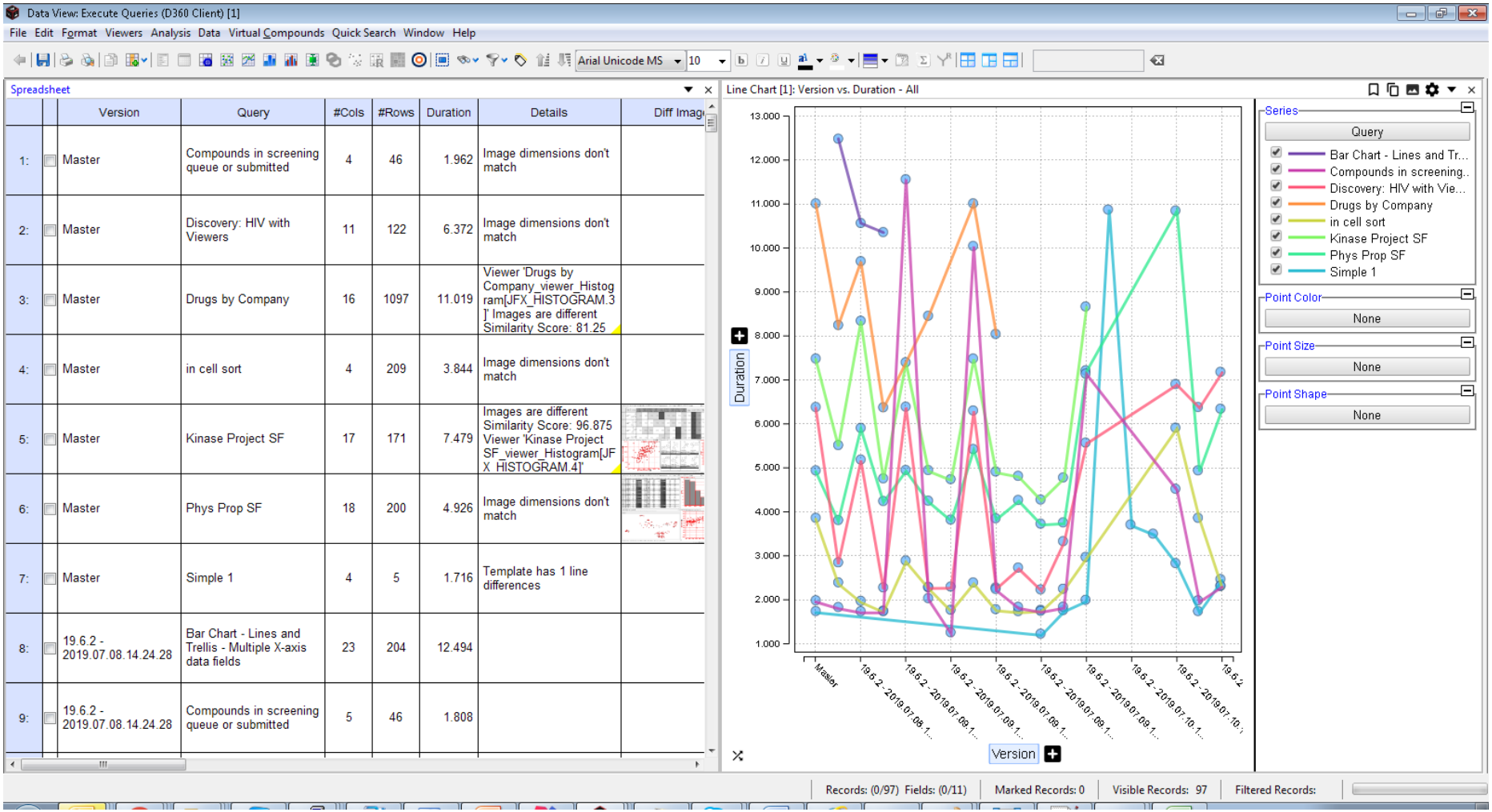
# Use Case 4 – Performance/Trends




| | Version | Query | #Cols | #Rows | Duration | Details | Diff Imag |
|---|---|---|---|---|---|---|---|
| 1: | Master | Compounds in screening queue or submitted | 4 | 46 | 1.962 | Image dimensions don't match | |
| 2: | Master | Discovery: HIV with Viewers | 11 | 122 | 6.372 | Image dimensions don't match | |
| 3: | Master | Drugs by Company | 16 | 1097 | 11.019 | Viewer 'Drugs by Company_viewer_Histogram[JFX_HISTOGRAM.3]' Images are different Similarity Score: 81.25 | |
| 4: | Master | in cell sort | 4 | 209 | 3.844 | Image dimensions don't match | |
| 5: | Master | Kinase Project SF | 17 | 171 | 7.479 | Images are different Similarity Score: 96.875 Viewer 'Kinase Project SF_viewer_Histogram[JFX_HISTOGRAM.4]' | |
| 6: | Master | Phys Prop SF | 18 | 200 | 4.926 | Image dimensions don't match | |
| 7: | Master | Simple 1 | 4 | 5 | 1.716 | Template has 1 line differences | |
| 8: | 19.6.2 - 2019.07.08.14.24.28 | Bar Chart - Lines and Trellis - Multiple X-axis data fields | 23 | 204 | 12.494 | | |
| 9: | 19.6.2 - 2019.07.08.14.24.28 | Compounds in screening queue or submitted | 5 | 46 | 1.808 | | |

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# Other Operations

- ***Export Queries***
  - Allows easily exporting many queries to the filesystem in a single operation.
  - Can be useful as a way to “snapshot” queries and/or to access the queries from another D360 environment.
- *Execute Queries on D360 Servers and Compare Results*
  - Execute against one server, and then immediate execute against a different server.
  - Minimizes differences to changing data.
  - Will be most useful for D360 19.6+ versions.

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# Questions?