CES 500019

AutoCAD Quick Scripting with Spreadsheets

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Learning Objectives

- Learning the basics of AutoCAD Script (.SCR) files
- Learn how to create a basic working AutoCAD Script (.SCR) file for automating a series of commands in AutoCAD
- Learn how to create a spreadsheet that can be saved and used for script generation
- Learn how to output a .TXT file and convert it to AutoCAD Script (.SCR) format

Description

Script (.scr) files can be used to quickly and easily automate strings of commands and repetitive command actions in AutoCAD software. Maximizing spreadsheet functionality to generate script files is a great way to take advantage of AutoCAD Script (.scr) files and get started with automation. In this class, we'll go over common scripting commands and set up a spreadsheet that can be used to output .TXT files for conversion to AutoCAD Script (.scr) files.

Speaker(s)

I am currently the Project Manager for IMAGINiT Technologies ISD Consulting Services with a B.S. in Mechanical Engineering and PE in Civil Engineering. Prior to joining IMAGINiT, I worked as a civil engineer, using Civil 3D on a variety of projects including site development, roadway improvements and infrastructure design. With nearly 20 years of experience in the civil engineering industry, I have provided training, consulting, technical support, and implementation strategies for organizations transitioning to Civil 3D and have been the Project Manager for our professional services team at IMAGINiT Technologies in the United States and Canada since 2018.

Basics of AutoCAD Scripting

AutoCAD Scripts are pre-defined “call” commands that run through the AutoCAD Command Line. Only text-based entries are supported, and .SCR files function identically to a Plain Text (.TXT) file, but with a different file type extension.

Anatomy of an AutoCAD Script

AutoCAD scripts contain content that would normally be entered manually via the command line.

- Each Text Entry typically represents one command or Option
- Each Space or New Line represents the “ENTER” Key for the command
- Root (-) Commands are best used for Scripts to force text entry and avoid dialog boxes
- As a best practice, end scripts with a blank “space” or “enter” to create an extra line in the file and confirm that the last text entry will be activated.

Scripts can be compiled in a single line, or with multiple rows. When a script is coded in a single line, each space between text entries acts as a command and option and the script will run until it runs out of information (text) to process.

Multiple row scripts are great for repeating commands where there are small edits from one row to the next. Repeating layer commands and block commands are good examples for multi-row scripts. Having multiple rows helps with visual consistency from line to line and option to option, and also applies well to leveraging spreadsheets and auto-fill functionality.

Creating a Working AutoCAD Script (.SCR)

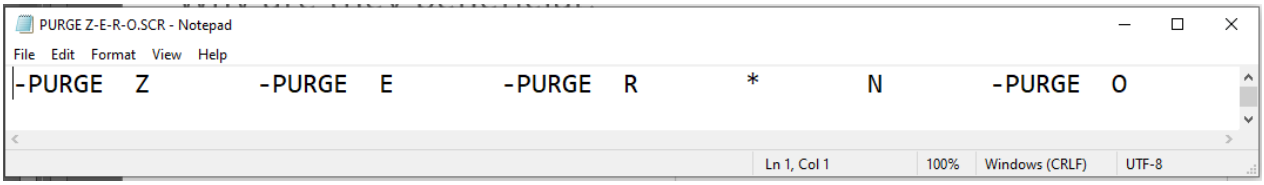
The first step in creating an AutoCAD Script is choosing the command and workflow you want to automate. Commands that include consecutive text-based entry, or repetitive commands that have slight modifications within their options each time they occur are great examples for scripts.

File cleanup functions are one of the best places to start for scripting. Because the PURGE command includes a “root” option (-PURGE) and all input is keyboard based, this is a perfect example for a simple script.

The standard PURGE command runs through a dialog box, and in previous releases of AutoCAD, it did not include RegApps and Unnamed Objects (Zero-Length Geometry, Empty Text and Orphaned Data). The process to remove these was to trigger the -PURGE command and enter the alphabetical choices (R, Z, E, and O) to purge the objects one by one.

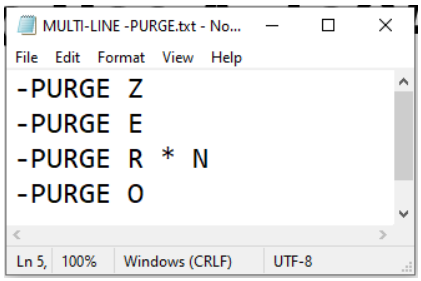
That repetition is easy to automate in a script with all of the command options included. By default, the 2022 version of AutoCAD includes these as optional items that can be selected (unchecked by default) which means additional clicks through the dialog box. A script reduces that to a single “drag and drop” or pasting script content into a command macro generates a single-click custom command that runs through all of the options.

Sample Single-Line Script for -PURGE with 4 Options



-PURGE Command with Multiple Options in a single-line script

Sample Multi-Line Script for Same Routine

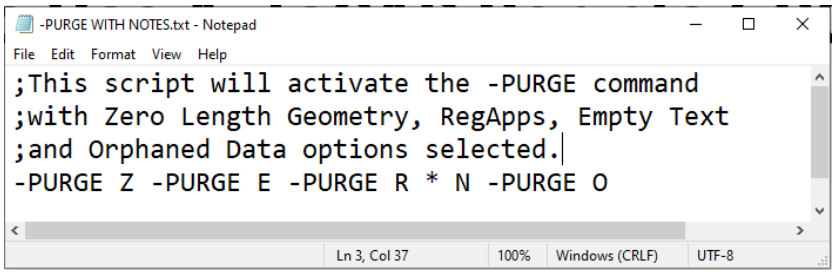


-PURGE Command with Multiple Options in a multi-line Script

In some cases, it may be helpful to include notes or additional information in a script file that is not part of the actual AutoCAD Command Entry. In these cases, starting a line with a semicolon ';" symbol indicates a line to be ignored when run by the application.

Adding notes or a description of what the script is created to automate is a good use of this function.

Sample Script with Notes Lines



Script with Ignored Notes

The script above includes three (3) lines at the top containing notes for the automation that will be triggered by the file. Using the ";" symbol at the start of each row identifies it as a line to be skipped by AutoCAD when running the script.

As long as the script is compiled correctly, the commands will run automatically with results appearing at the command line.

Common Scripting Errors & Editing

In most cases, spelling errors, or an extra “space” or “enter” key stroke somewhere in the code will cause an error. AutoCAD will not identify an error in the code, but a script may stop or end prematurely if an option or entry is out of place. To resolve errors, review the command line history and find out where the script stopped, then open the .SCR file (it opens in Notepad) to modify the location where the script stopped functioning. Save the edited file and drag/drop it into AutoCAD to test the results.

When using spreadsheets, extra spaces are very common if rows and cells are not uniform from in multi-line processes. Exporting blank cells as part of the output will create extra spaces in the .TXT file that is generated from the spreadsheet.

Leveraging Spreadsheets for Script Generation

Spreadsheets are excellent for script generation, as they provide columns and rows that are nice and organized. Additionally, the ability to reference cell data and auto-fill to create extra rows speeds things up tremendously compared to a basic text editor.

Having multiple tabs in a single spreadsheet file is also a convenient way to keep track of your scripts in a Script Library that can be accessed and exported as needed.

Setting Up a Spreadsheet for Scripting

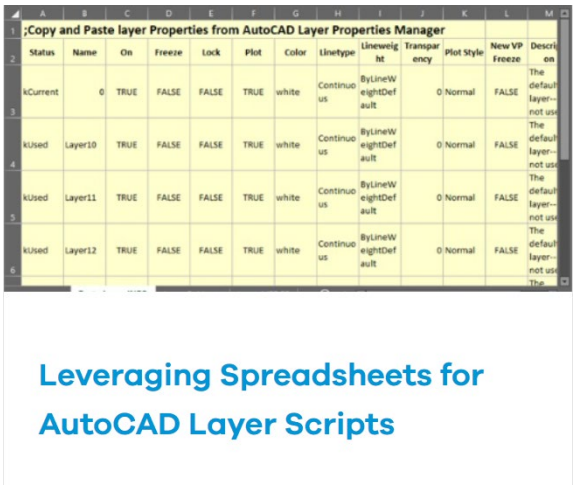
When using spreadsheets, leveraging the “;” character to add notes on skipped lines is highly recommended. Additional data for user entry, reference information and content can be added as column labels to clarify how the script file should be populated.

Linking data to referenced cells is another great way to leverage spreadsheets. When working with AutoCAD Layer information, Layer Properties can be copied and pasted directly out of the Layer Properties Manager into a spreadsheet. Pre-setting linked cell data allows you to quickly copy and paste data from a preferred file and automatically update the referenced files on the tabs that contain script code. Copied and Pasted data may also include more information that you need to call for in a script file, so designating one tab in a spreadsheet for pasted content and linking the relevant cells to script-specific tabs where the data is needed adds efficiency to the process.

Spreadsheets can also be set up with Look-Up tables that contain user specific data that can be populated as needed. Block names, printers, and other AutoCAD specific lists can be entered into a spreadsheet and referenced via a Look-Up table to avoid spelling errors and inconsistencies when defining script content.

Tabs can also be Moved or Copied into their own files for backup purposes and easy export to .TXT format once a script has been confirmed for functionality.

For more information on setting up a spreadsheet for Layer Script generation, I've written a reference article that has been posted to our IMAGINiT Civil Solutions blog (click the image to access the article).



When using references and copied content, be aware of any spaces in file names or object names. Script files recognize "spaces" as a key stroke in the AutoCAD Command line, so having spaces in a file name or block name may lead to an issue when running the script.

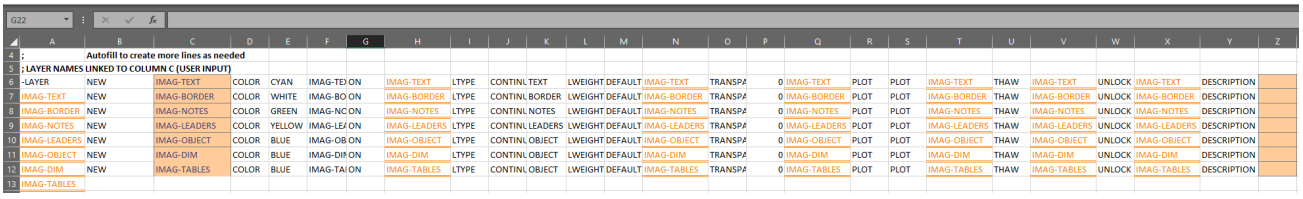
In most cases, this can be resolved by re-naming the objects using underscore "_" instead of spaces or quotation marks "" around a file name to be called within the script process.

Sample Script with File Path Name Containing Spaces

```
FILEDIA     0
OPEN        "D:\00-IMAGINiT\MARKETING\Autodesk University\2021\DWG\IMAG-1.DWG"
FILEDIA     1
```

The scripted code above sets the FILEDIA variable to "0" to de-activate dialog boxes, then opens an existing drawing called IMAG-1.DWG before setting FILEDIA back to 1. Since the full file path being called contains folder locations that include spaces in their names, quotation marks are added to identify it as a single text entry versus multiple entries separated with spaces.

Sample Script with No Space Characters



In the above script, new company specific layers are being created from scratch. The names have been specified using "-" symbols instead of spaces to avoid the issue all together. Notes and linked cells are also included to speed up the process of filling in the required Layer name information and cell formatting is applied to identify which cells are for user input and which cells are linked and populate automatically.

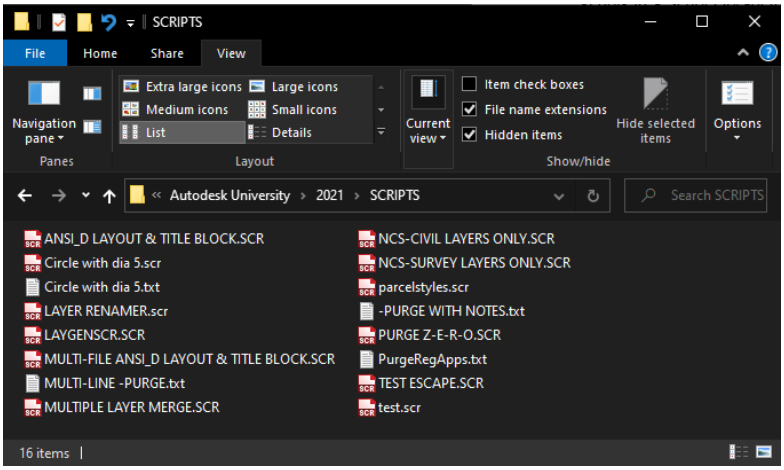
Converting Plain Text .TXT to AutoCAD Script (.SCR) Files

When it comes to generating an AutoCAD Script (.SCR) file, the process is fairly simple. A script file looks and functions the same way a plain text file works. Both files can be opened and edited in a notepad type application with the only difference being the file type extension.

The easiest way to convert a .TXT to .SCR is to click on it and change the extension. Spreadsheet tabs can be saved or exported directly to a .TXT file, so that covers the initial step of outputting the script content into a plain text file. Once the .TXT file is created, changing the "TXT" extension to "SCR" will convert it into an AutoCAD Script file.

It's also good practice to keep a copy of the original .TXT file in case you need to make any small modifications or create additional scripts from predefined content without accidentally overwriting your working .SCR file.

If you're unable to see the file type extension when viewing the files on your system, verify that the option to view "File name extensions" is checked. If that is not selected, you'll be able to see the main file name, but will not have access to the file type extension for editing.



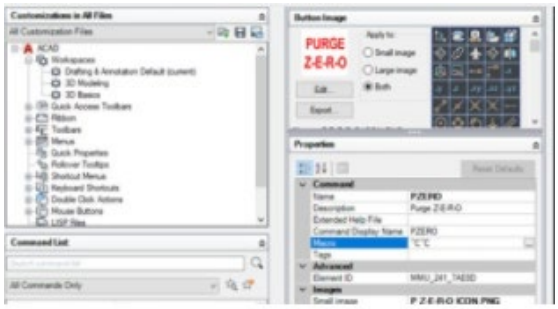
AutoCAD .SCR files and Plain Text (.TXT) Files

BONUS: Command Macros from Script Files

As mentioned earlier, converting a script file into an AutoCAD command macro is one way to go from “drag and drop” to a single-click custom command. AutoCAD Macros can be created and defined through the CUI command, and once defined, they can be added to a ToolPalette for one-click access to your automated routines.

Command Macros have added functionality that a simple script does not support, but they also have the ability to understand script content that’s copied and pasted directly into the Long String Editor that’s used to define the Macro.

If you are interested in seeing how a script content can be converted into a custom AutoCAD Command Macro, I’ve posted another reference article with some additional details and instructions found below (click the image to access the article).



Creating Command Macros from AutoCAD Scripts

Thanks for attending my session. Please feel free to connect with me through the AU2021 session link during the conference, or reach out to me at IMAGINiT Technologies.

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