Spatial Analysis with ArcGIS Pro
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What is analysis?

Analysis transforms raw data into information or knowledge.

**Spatial analysis** does this for geographic or spatial data.
Spatial analysis is used to answer *where* or location questions

- Where is the best location for a new community center?
- Where is an area with statistically high crime rates?
- Where has the landscape changed in the last 10 years?
What is geoprocessing?

**Geoprocessing** is a rich suite of tools for *processing* geographic data
Spatial analysis + GIS data management

A typical geoprocessing tool processes input data and produces an output

Geoprocessing is also a framework you can use to model and automate processes using ModelBuilder or Python scripts.
Analysis in ArcGIS Pro

ArcGIS Pro provides incredible analysis capabilities in 2D, 3D, and 4D (time)
Scalable 64-bit execution, non-blocking threading, and improved visualization

Geoprocessing is the technology that enables spatial analysis in the ArcGIS Platform
Analysis in ArcGIS Pro

The *Analysis* ribbon tab provides access to:
- Gallery of commonly-used tools
- Suite of all ~800 geoprocessing tools
- ArcGIS Enterprise and Online analysis tools
- Geoprocessing History
- Python command line

- ModelBuilder
- Network Analysis
- Imagery processing / raster functions
- Data Interoperability Workbench
Geoprocessing in ArcGIS Pro

Full user experience driven through the Geoprocessing pane
- Search for tools or browse Toolboxes tree-view
- Open tool and set parameter and environment settings
- Run the tool and track progress

Easy migration for ArcMap users
Supports most* tools, models, and Python scripts that work in ArcMap
  *ArcObjects-based custom tools are not supported
Supports traditional feature and raster data sources as well as web layers
History provides a log of all tools you run
Share as a geoprocessing package or web tool
Create a geoprocessing workflow

Automate geoprocessing in a Python script

To get started, run the tool in Pro, then

*Copy Python command* and paste into script

```python
arcpy.Buffer_analysis(input, output, "10 Miles")
```

Build a model of your workflow using ModelBuilder

Connect tools and data to make a diagram that represents your workflow
Python in ArcGIS Pro

Uses Conda environment manager and enhanced with built-in Python Package Manager

Makes it easy to find and install additional libraries, including Python API for ArcGIS for scripting portal operations

Includes new libraries: Pandas, SciPy, NetCDF4
Charts

Use charts to explore your data and communicate a message

Include as part of your analysis workflow to:

Understand patterns and relationships before running an analysis
Communicate information about your analysis results

Create a bar chart, scatter plot, histogram, line chart, profile graph or box plot

Fully interactive with the map layers and extent, attribute table, and range and time filters
Ready to use tools
ArcGIS Online

Analytical operations hosted by ArcGIS Online, using Esri curated elevation, hydrologic, and street network data

Simply provide a few basic inputs

Uses ArcGIS.com credits and you must be connected to an ArcGIS online organization with analysis privileges
Demo: Charting, Analysis tools and Model Builder
Analysis Extensions

Extensions build on the core analysis capabilities of ArcGIS Pro

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Primarily comprised of additional geoprocessing toolboxes
Licensing same as ArcMap
Manage extension licenses the same way you license Pro (Named User, Single Use, Concurrent Use)
Resources

- Perform Analysis ArcGIS Online Page

- Analytics Case Studies

- Learn ArcGIS Lesson Gallery

- Esri Training Portal
  - https://www.esri.com/training/

- ArcGIS Pro GeoProcessing FAQ’s
  - esriurl.com/GPproFAQ