Geocoding Workflows in Python

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Outline

- Publishing locators
- arcpy.geocoding.Locator object
  - .geocode()
  - .reverseGeocode()
  - .suggest() and .geocodeWithSuggest()
  - Properties
- Geocoding Geoprocessing Tools

Publishing & Sharing Locators

Creating Geocoding Services on ArcGIS Server & Enterprise

Benefits to creating a Geocoding Service

- Easy to share with colleagues
- Off-loads the processing to ArcGIS Server
- Useable in configurable apps & ArcGIS Pro

Publishing a locator to ArcGIS Server

```python
# path to the locator you want to publish. Do NOT include .loc at the end
locator_path = r"C:\data\locators\RedlandsLocator"

# path to the AGS connection file. Do NOT include .ags at the end
ags_connection = r"C:\ags_connections\servername"

# the service name you want to publish it as
service_name = "RedlandsLocator"

current_dir = os.getcwd()

# put the sd draft files & sd files in the current working directory
sddraft_file = os.path.join(current_dir, str(service_name) + ".sddraft")
sd_file = os.path.join(current_dir, str(service_name) + ".sd")
summary = "Address locator"
tags = "address, locator, geocode"

# Create the sd draft file
analyze_messages = arcpy.CreateGeocodeSDDraft(locator_path, sddraft_file, service_name,
                                              connection_file_path=ags_connection, copy_data_to_server=True,
                                              summary=summary, tags=tags, max_result_size=20,
                                              max_batch_size=500, suggested_batch_size=150, overwrite_existing_service=True)

# stage and upload the service if the sddraft analysis did not contain errors
if analyze_messages['errors'] == {}:
    #try:
    # Execute StageService to convert sddraft file to a service definition (sd) file
    arcpy.server.StageService(sddraft_file, sd_file)
    # Execute UploadServiceDefinition to publish the service definition file as a service
    arcpy.server.UploadServiceDefinition(sd_file, ags_connection)
    print("The geocode service was successfully published")
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Sharing a locator to ArcGIS Enterprise

```python
# path to the locator you want to publish. Do NOT include .loc at the end
locator_path = r"C:\data\locators\SanDiegoLocator"

# the service name you want to publish it as
service_name = "SanDiegoLocator"

current_dir = os.getcwd()

# put the sd draft files & sd files in the current working directory
sddraft_file = os.path.join(current_dir, str(service_name) + ".sddraft")
sd_file = os.path.join(current_dir, str(service_name) + ".sd")
summary = "Address locator"
tags = "address, locator, geocode"

# The URL of the federated server you are publishing to
in_server = "https://machinename.domainname.com/server"
# Sign into the Portal that is federated with the in_server
arcpy.SignInToPortal("https://machinename.domainname.com/portal", "username", "password")

# Create the sd draft file
analyze_messages = arcpy.CreateGeocodeSDDraft(locator_path, sddraft_file, service_name,
                                              copy_data_to_server=True,
                                              summary=summary, tags=tags, max_result_size=20,
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                                              overwrite_existing_service=True)

# Stage and upload the service if the sddraft analysis did not contain errors
if analyze_messages['errors'] == {}:
    try:
        # Execute StageService to convert sddraft file to a service definition
        # (sd) file
        arcpy.server.StageService(sddraft_file, sd_file)

        # Execute UploadServiceDefinition to publish the service definition
        # file as a service
        arcpy.server.UploadServiceDefinition(sd_file, in_server)
        print("The locator was successfully shared to Portal")
```

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```

Documentation about Sharing a Locator

Python sample: https://esriurl.com/PythonPublishLocator

Syntax

```
CreateGeocodeSDDraft (loc_path, out_sddraft, service_name, {server_type},
{connection_file_path}, {copy_data_to_server}, {folder_name}, {summary}, {tags},
{max_result_size}, {max_batch_size}, {suggested_batch_size},
{supported_operations}, {overwrite_existing_service})
```

arcpy.geocoding.Locator

A new way to access & use locators in Python

arcpy.geocoding.Locator()

- **Locator object introduced new at ArcGIS Pro 2.6**

- **Three ways to create a Python locator object**
  - **From a path to your locator on your machine**
  - **From an AGS connection file on your machine**
  - **From a URL**

- **Python locators support:**
  - **.geocode()**
  - **.reverseGeocode()**
  - **.suggest() and .geocodeWithSuggest()**
  - **.properties (getting & setting)**

Create a locator from a path

```
### path example
locator_path = r"D:\data\locators\MyCityLocator"
locator = arcpy.geocoding.Locator(locator_path)
output = locator.geocode("Your home address", True)
print(output)
```

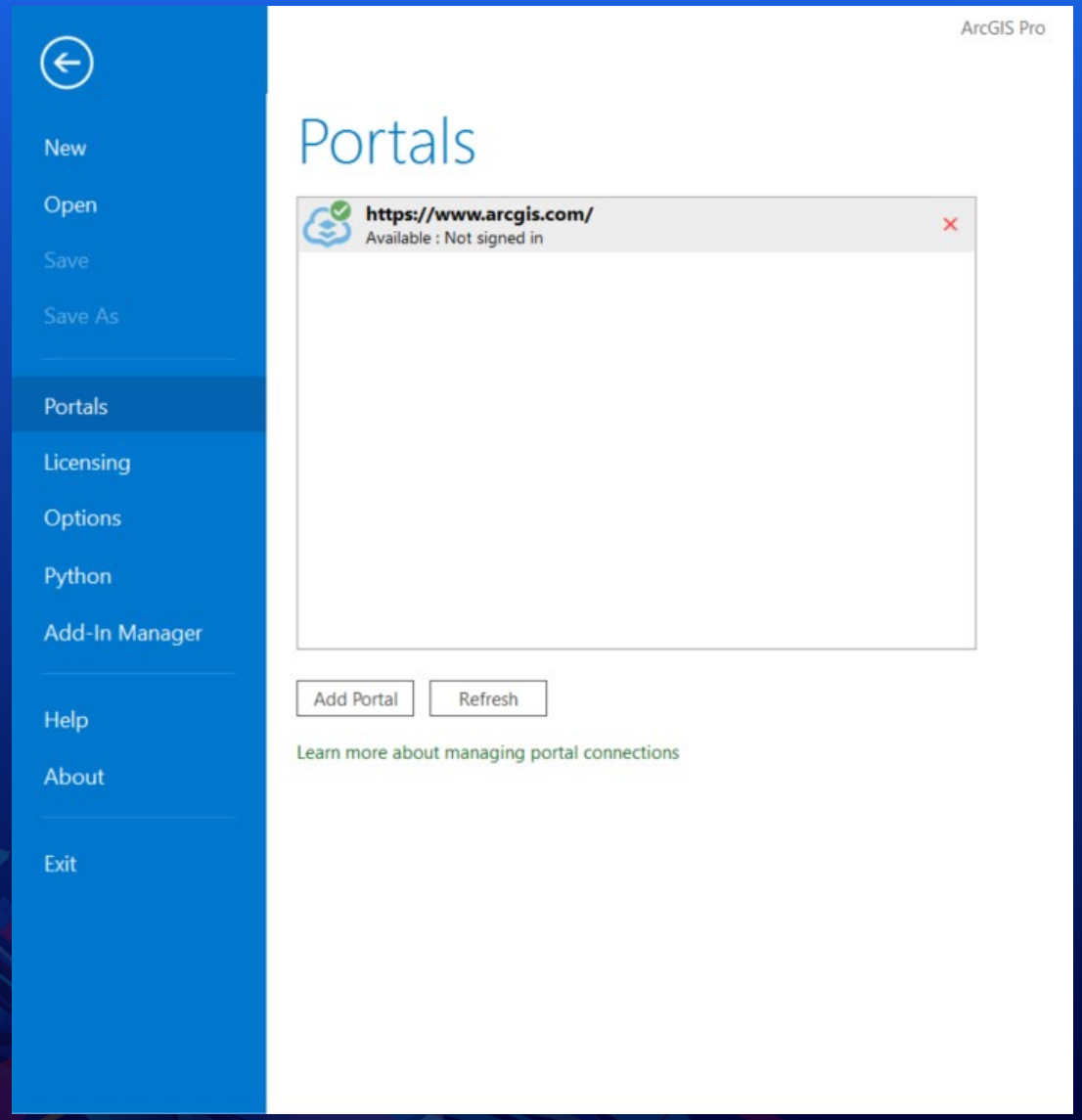
Create a locator from an AGS connection

```
### AGS connection example
locator_path = r"C:\ags_connection_files\agsFileName.ags/CAN"
locator = arcpy.geocoding.Locator(locator_path)
output = locator.geocode("Quebec", True)
print(output)
```

Create a locator from a URL

```
### URL example
arcpy.SignInToPortal("https://machinename.domainname.com/portal","username","password")
url = "https://machinename.domainname.com/server/rest/services/FolderName/ServiceName/GeocodeServer/ItemName"
locator = arcpy.geocoding.Locator(url)
output = locator.geocode("New York City", False)
print(output)
```

A note about Portal Sign-In



~~arcpy.SignInToPortal()~~

Using the World Geocoding Service

```
### World Geocoding service example
arcpy.SignInToPortal("https://www.arcgis.com/", username='username', password='password')
url = "https://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer/ArcGIS World Geocoding Service"
locator = arcpy.geocoding.Locator(url)
output = locator.geocode("380 New York St. Redlands, CA 92373", True)
print(output)
```

Using locator.geocode()

```
### World Geocoding service example
arcpy.SignInToPortal("https://www.arcgis.com/", username='username', password='password')
url = "https://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer/ArcGIS World Geocoding Service"
locator = arcpy.geocoding.Locator(url)
candidates = locator.geocode("Disneyland, CA", True)
print(candidates)
```

Using locator.reverseGeocode()

```
### World Geocoding service example
arcpy.SignInToPortal("https://www.arcgis.com/", username='username', password='password')
url = "https://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer/ArcGIS World Geocoding Service"
locator = arcpy.geocoding.Locator(url)

###Create input PointGeometry object
spatial_reference = arcpy.SpatialReference(4326)
point = arcpy.Point(-117.196, 34.058)
point_geometry = arcpy.PointGeometry(point, spatial_reference)

reverse_candidates = locator.reverseGeocode(point_geometry, True)
print(reverse_candidates)
```

Using locator.suggest()

```
### World Geocoding service example
arcpy.SignInToPortal("https://www.arcgis.com/", username='username', password='password')
url = "https://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer/ArcGIS World Geocoding Service"
locator = arcpy.geocoding.Locator(url)
suggest_candidates = locator.suggest("Disney")
geocode_candidates = locator.geocodeWithSuggest(suggest_candidates[0], True)
print(geocode_candidates)
```

Using locator.properties

- locator.spatialReference
- locator.supportedRoles
- locator.supportedCountries
- locator.matchOutOfRange*
- locator.minMatchScore*
- locator.categories*
- locator.reverseGeocodeFeatureTypes*
- locator.numberOfThreads*
- locator.maxCandidates*
- locator.defaultSuggestCandidates*
- locator.maxSuggestCandidates*
- locator.minCandidateScore*
- locator.capabilities
- locator.multilineInputFields
- locator.singlelineInputField

- For more info: https://esriurl.com/PythonLocator

** denotes the property can be set.*

Setting a property

```python
### properties example
locator_path = r"D:\data\locators\Atlanta"
locator = arcpy.geocoding.Locator(locator_path)
min_score = locator.minCandidateScore
print(min_score)
output = locator.geocode("1171 Peidmont blvd atlanta, ga", True)
print(output)

### raise the minCandidateScore
locator.minCandidateScore = 95
print(locator.minCandidateScore)

output = locator.geocode("1171 Peidmont blvd atlanta, ga", True)
print(output)
locator.minCandidateScore = 95
print(locator.minCandidateScore)
```

```
60
[{'Match_addr': '1171 Piedmont Ave NE, Atlanta, GA, 30309', 'Status': 'M', 'Score': 94.24, 'LongLabel': '1171 Piedmont A
ve NE, Atlanta, GA, 30309', 'ShortLabel': '1171 Piedmont Ave NE', 'Addr_type': 'StreetAddress', 'Type': '', 'PlaceName':
 '', 'Place_addr': '1171 Piedmont Ave NE, Atlanta, GA, 30309', 'Phone': '', 'URL': '', 'Rank': 20.0, 'AddBldg': '', 'Add
95
[]
95
```

Setting a property vs .updateLocator()

```
### raise the minCandidateScore for this Python run
locator.minCandidateScore = 95
print(locator.minCandidateScore)
```

```
### raise the minCandidateScore for this Locator until it is set again
locator.minCandidateScore = 95
locator.updateLocator()
```

[{'Shape': <Point (-71.21929999999998, 46.812730000000045, #, #)>, 'Status': 'T', 'Score': 100.0, 'Match_addr': 'Québec'
, 'LongLabel': 'Québec, CAN', 'ShortLabel': 'Québec', 'Addr_type': 'Locality', 'Type': 'City', 'PlaceName': 'Québec', 'P
lace_addr': 'Québec', 'Phone': '', 'URL': '', 'Rank': 3.0, 'AddBldg': '', 'AddNum': '', 'AddNumFrom': '', 'AddNumTo': ''
, 'AddRange': '', 'Side': '', 'StPreDir': '', 'StPreType': '', 'StName': '', 'StType': '', 'StDir': '', 'BldgType': '',
'BldgName': '', 'LevelType': '', 'LevelName': '', 'UnitType': '', 'UnitName': '', 'SubAddr': '', 'StAddr': '', 'Block':
'', 'Sector': '', 'Nbrhd': '', 'District': '', 'City': 'Québec', 'MetroArea': 'Communauté Métropolitaine de Québec', 'Su
bregion': 'Québec', 'Region': 'Québec', 'RegionAbbr': 'QC', 'Territory': '', 'Zone': '', 'Postal': '', 'PostalExt': '',
'Country': 'CAN', 'LangCode': 'FRE', 'Distance': 0.0, 'X': -71.21929999999998, 'Y': 46.812730000000045, 'DisplayX': -71.
21929999999998, 'DisplayY': 46.812730000000045, 'Xmin': -71.38729999999998, 'Xmax': -71.05129999999997, 'Ymin': 46.64473
0000000045, 'Ymax': 46.980730000000044, 'ExInfo': ''}, {'Shape': <Point (-71.74874224599995, 53.382603420000066, #, #)>,
 'Status': 'T', 'Score': 100.0, 'Match_addr': 'Québec', 'LongLabel': 'Québec, CAN', 'ShortLabel': 'Québec', 'Addr_type':
 'Locality', 'Type': 'State or Province', 'PlaceName': 'Québec', 'Place_addr': 'Québec', 'Phone': '', 'URL': '', 'Rank':
 6.0, 'AddBldg': '', 'AddNum': '', 'AddNumFrom': '', 'AddNumTo': '', 'AddRange': '', 'Side': '', 'StPreDir': '', 'StPreT
ype': '', 'StName': '', 'StType': '', 'StDir': '', 'BldgType': '', 'BldgName': '', 'LevelType': '', 'LevelName': '', 'Un
itType': '', 'UnitName': '', 'SubAddr': '', 'StAddr': '', 'Block': '', 'Sector': '', 'Nbrhd': '', 'District': '', 'City'
: '', 'MetroArea': '', 'Subregion': '', 'Region': 'Québec', 'RegionAbbr': 'QC', 'Territory': '', 'Zone': '', 'Postal': '
', 'PostalExt': '', 'Country': 'CAN', 'LangCode': 'FRE', 'Distance': 0.0, 'X': -71.74874224599995, 'Y': 53.3826034200000
66, 'DisplayX': -71.74874224599995, 'DisplayY': 53.382603420000066, 'Xmin': -81.81274224599994, 'Xmax': -61.684742245999
95, 'Ymin': 43.318603420000066, 'Ymax': 63.446603420000066, 'ExInfo': ''}, {'Shape': <Point (-71.36076335999996, 46.8392

Using arcpy.geocoding. Locator to do geocoding

Victor

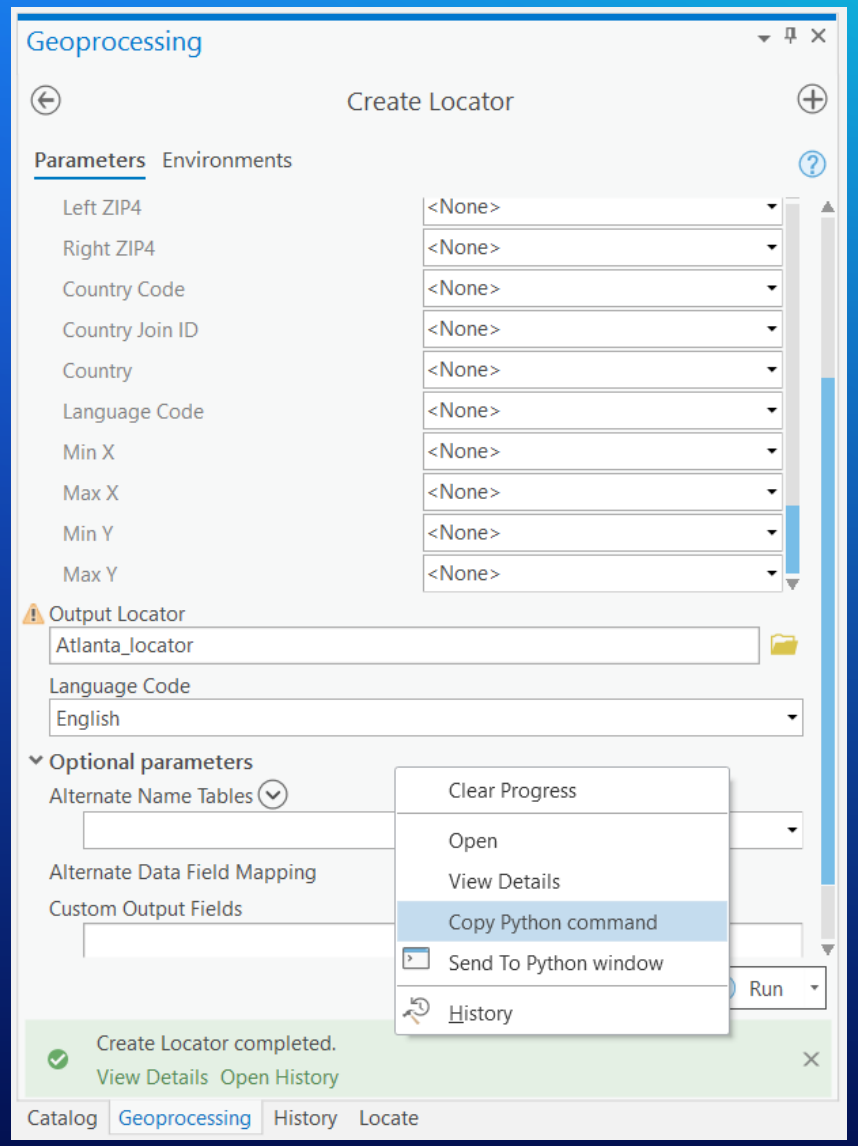
Geocoding using Geoprocessing Tools

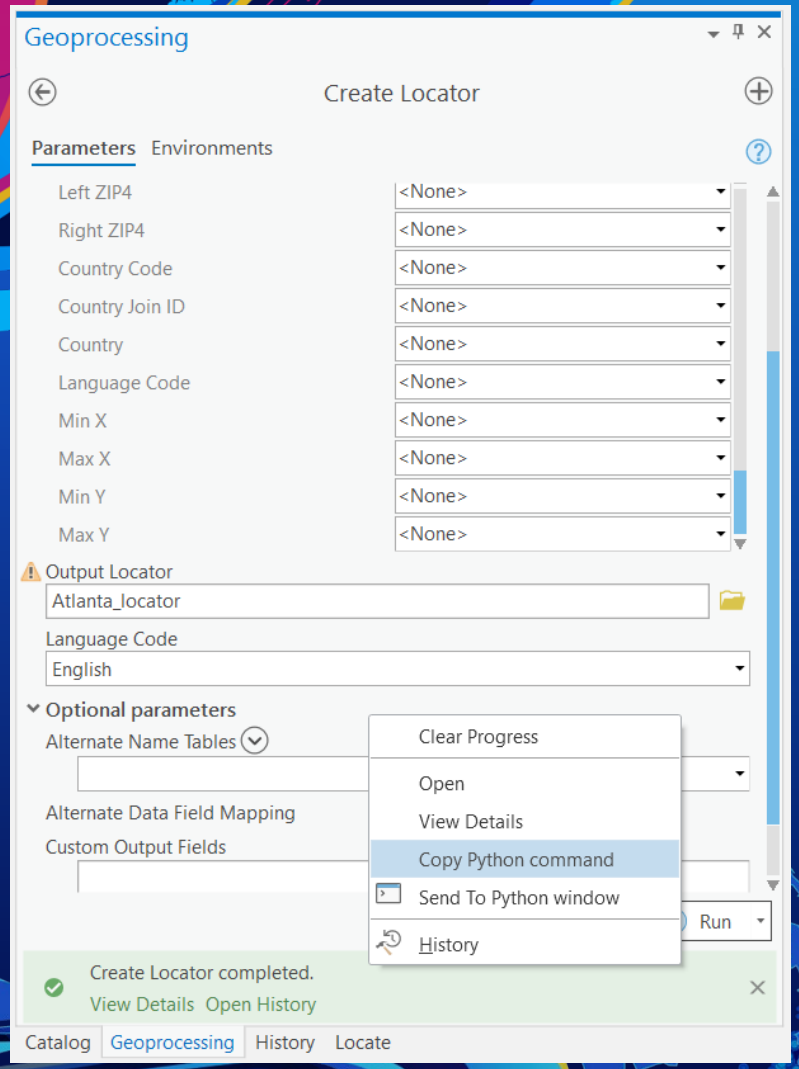
Copy Python Snippet from Pro

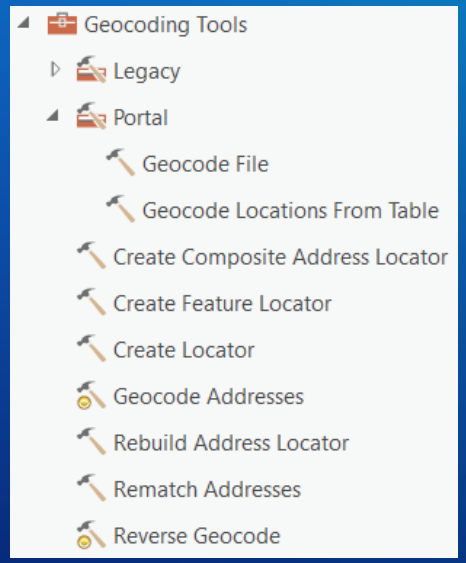
Geocoding Geoprocessing Tools in Python

- The best way to automate your GP processes is to:

1. Run the tool in ArcGIS Pro
2. Right-click -> “Copy Python command”
3. Paste into your favorite IDE
4. Edit the parameters so that they are full paths
5. Run your new Python script!







Geocoding GP Tools in Python

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All code snippets available!

- https://esriurl.com/PythonGeocoding

- Includes:
  - Publishing & Sharing (https://esriurl.com/PythonPublishLocator)
  - arcpy.geocoding.locator module examples (https://esriurl.com/PythonLocator)

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