

Comparing Feature Geometries and using Geometry Objects in ArcTools

Arcpy geoprocessing

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This video will discuss how to compare feature geometries and how to use geometry objects directly with ArcTools.

Comparing geometries

- Can compare geometry of one feature to geometry of a different feature...
- Methods return **True** or **False**.
- Does geom1 contain geom2...

```
geom1.contains(geom2)
```

```
>>> polyGeom.contains(pntGeom)  
True
```



- Is geom1 identical to geom2...

```
geom1.equals(geom2)
```

```
>>> pnt1Geom.equals(pnt2Geom)  
True
```



FID	Shape *	Id
0	Point	0
1	Point	0

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The geometry object contains methods for comparing two geometry objects.

These methods return a True/False result. Available tests include determining if the feature's geometry

- contains the geometry of another feature.
- Or is identical to the geometry of another feature.

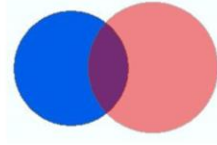
Comparing geometries

- Does geom1 overlap geom2...

```
geom1.overlaps(geom2)
```

```
>>> geom1.overlaps(geom2)
```

```
True
```



- Does geom1 touch the boundary of geom2...

```
geom1.touches(geom2)
```

```
>>> geom1.touches(geom2)
```

```
True
```



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The geometry object methods can test if two geometries overlap...

Or share a common boundary.

Geometry objects as ArcTool inputs

- Geometry object can be used as input, for certain tools, in place of a feature class.
- To use geometry as an ArcTool input, create or get a geometry object...

```
geom = row.getValue("Shape")
```

```
geom = arcpy.Polygon(featArray)
```

```
geom = arcpy.Polyline(featArray)
```

```
geom = arcpy.PointGeometry(pnt)
```

feature array

point object

- Use geom as input for ArcTool...

```
arcpy.Clip_analysis("wetlands.shp", geom, "wetland_clip.shp")
```

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The geometry object can be used as the input for certain tools in place of a feature class. This allows you to skip the step of creating a new shapefile when it is just an intermediate dataset.

You can create a geometry object by 1) retrieving it from an existing feature,

2) Creating it using arcpy's Polygon, 3) Polyline, or 4) Point Geometry methods.

Once the geometry object is obtained, it can be used in ArcTool statements for parameters that accept a feature class. Note that not all ArcTool statements will accept the geometry object as a input.

Geometry objects as ArcTool outputs

- Geometry object can be used as ArcTool output in place of a feature class.
- First, create an empty geometry object (can be used for any feature type)...

```
geom = arcpy.Geometry()
```
- Then CopyFeatures - using geom as output...

```
geomLst = arcpy.CopyFeatures_management ("towns.shp", geom)
```
- geomLst works like a Python list...

```
for geom in geomLst:  
    print geom.area
```

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The geometry object can also serve as the output for certain ArcTools.

To use a geometry object as an output, first create an empty geometry object using arcpy's Geometry method.

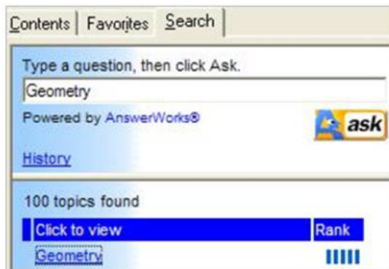
You can then use arcpy's CopyFeatures tool with the geometry object specified as the output. In this case, the geometries of all the features in "towns.shp" will be stored in the geomLst.

The list of geometries can be iterated like a python list. Working with geometry objects can be more efficient when they can take the place of intermediate datasets that do not need to be saved after the script completes.

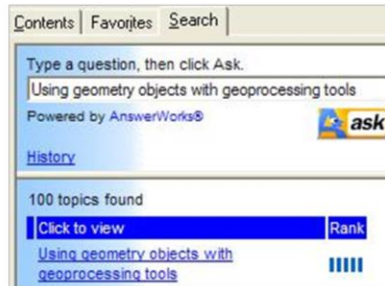
ArcGIS help

For further info search ArcGIS's documentation...

Geometry object...



Using geometry object with ArcTools...



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Refer to the ArcGIS documentation for further information on the capabilities of geometry objects.