Crystal Hollis
GISC 2335 GIS Programming
4/11/2025

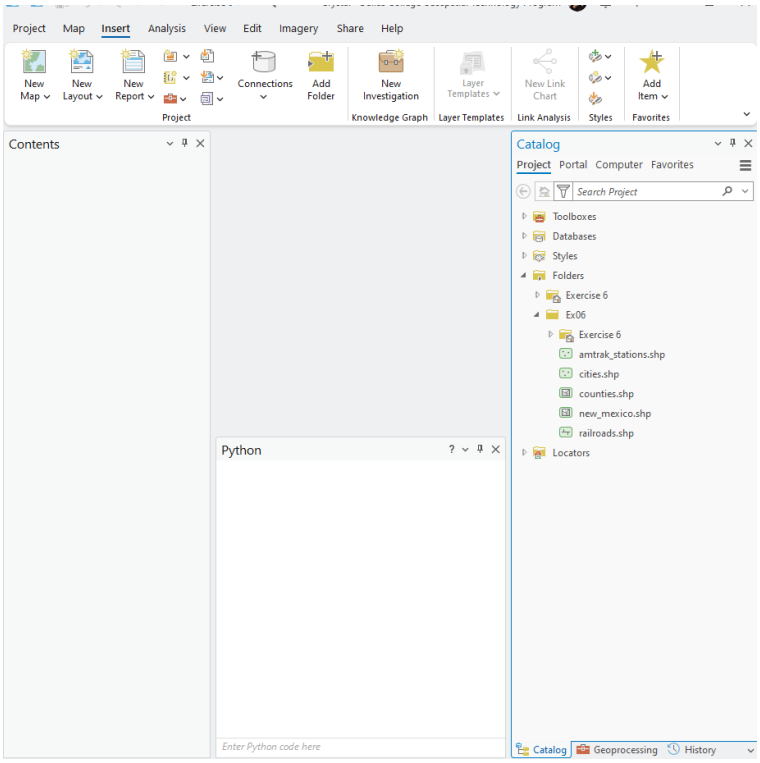
Week 7 Chapter 6

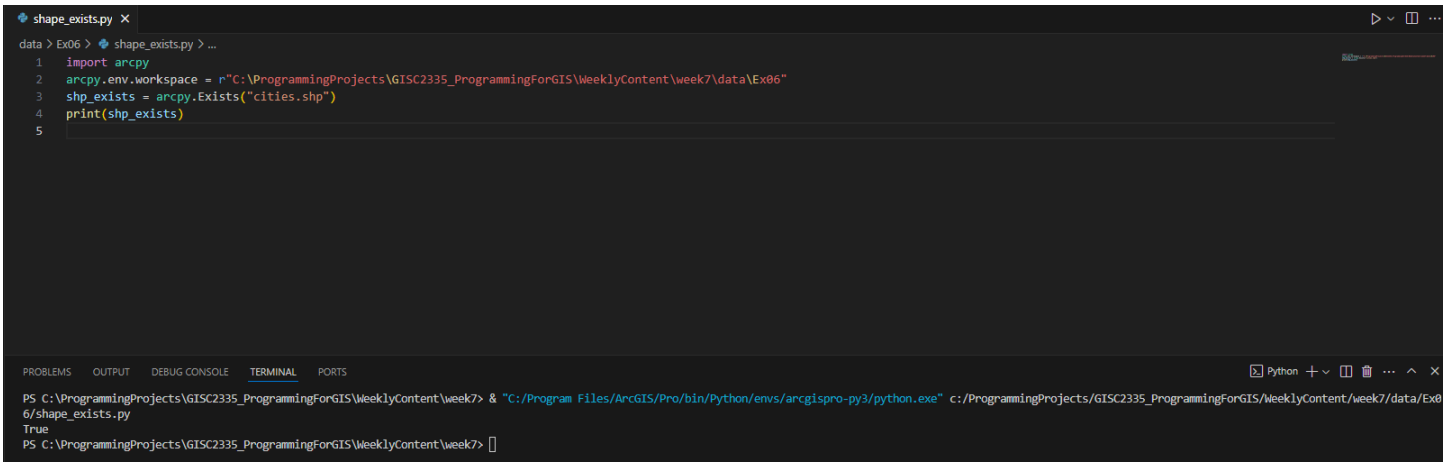
Lab materials saved on GitHub in GISC2335_ProgrammingForGIS/WeeklyContent/week7

https://github.com/crystaljhollis/DallasCollege_Portfolio/tree/main/GISC2335_ProgrammingForGIS/WeeklyContent/week7

Lab 6: EXPLORING SPATIAL DATA

Check for the existence of data





shape_exists.py

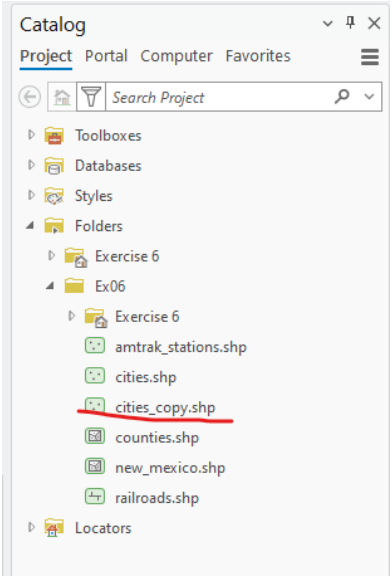
```
import arcpy
arcpy.env.workspace = r"C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7\data\Ex06"
shp_exists = arcpy.Exists("CITIES.SHP")
print(shp_exists)
```

```
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arcgispro-py3/python.exe" c:/ProgrammingProjects/GISC2335_ProgrammingForGIS/WeeklyContent/week7/data/Ex06/shape_exists.py
True
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arcgispro-py3/python.exe" c:/ProgrammingProjects/GISC2335_ProgrammingForGIS/WeeklyContent/week7/data/Ex06/shape_exists.py
True
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7>
```

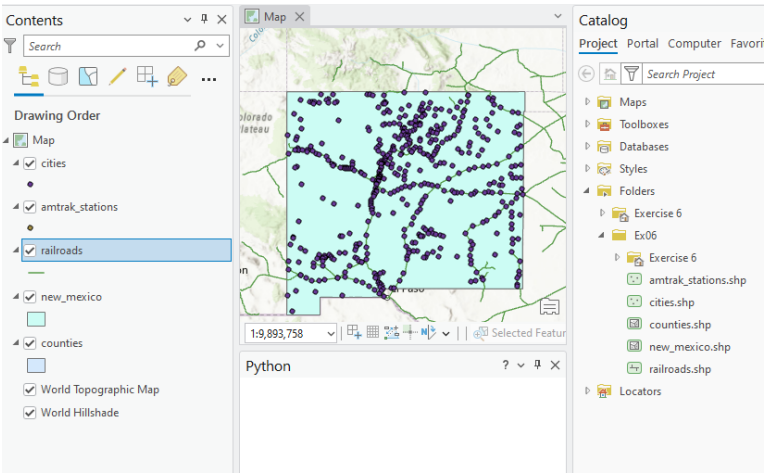
shape_exists.py

```
import arcpy
arcpy.env.workspace = r"C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7\data\Ex06"
fc = "cities.shp"
newfc = "cities_copy.shp"
if arcpy.Exists(fc):
    arcpy.CopyFeatures_management(fc, newfc)
```

```
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arcgispro-py3/python.exe" c:/ProgrammingProjects/GISC2335_ProgrammingForGIS/WeeklyContent/week7/data/Ex06/shape_exists.py
True
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arcgispro-py3/python.exe" c:/ProgrammingProjects/GISC2335_ProgrammingForGIS/WeeklyContent/week7/data/Ex06/shape_exists.py
True
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arcgispro-py3/python.exe" c:/ProgrammingProjects/GISC2335_ProgrammingForGIS/WeeklyContent/week7/data/Ex06/shape_exists.py
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7>
```



Describe the data




```
Python
mylyr = arcpy.da.Describe("cities")
mylyr["dataType"]
'FeatureLayer'
arcpy.da.Describe("cities") ["dataType"]
'FeatureLayer'
myshp = arcpy.da.Describe(r"C:
\ProgrammingProjects\GISC2335_ProgrammingForGIS
\WeeklyContent\week7\data\Ex06\cities.shp")
mysp["dataType"]
Traceback (most recent call last):
  File "<string>", line 1, in <module>
NameError: name 'mysp' is not defined. Did you
mean: 'myshp'?
myshp["dataType"]
'ShapeFile'
myshp["datasetType"]
'FeatureClass'
myshp["file"]
'cities.shp'
myshp["shapeType"]
'Point'
myshp["spatialReference"]
<SpatialReference object at 0x214a9325310
[0x1d3a6f67bb0]>
```

```
myshp["spatialReference"].name
'GCS_North_American_1983'
myshp["spatialreference"].type
Traceback (most recent call last):
  File "<string>", line 1, in <module>
KeyError: 'spatialreference'
myshp["spatialReference"].type
'Geographic'
```

List data

list_data.py

data > Ex06 > list_data.py > ...

```
1  import arcpy
2  arcpy.env.workspace = r"C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7\data\Ex06"
3  fclist = arcpy.ListFeatureClasses()
4  print(fclist)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/a
nt/week7/data/Ex06/list_data.py
['amtrak_stations.shp', 'cities.shp', 'counties.shp', 'new_mexico.shp', 'railroads.shp']
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7>
```

list_data.py

data > Ex06 > list_data.py > ...

```python
import arcpy
arcpy.env.workspace = r"C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7\data\Ex06"
fclist = arcpy.ListFeatureClasses()
for fc in fclist:
    fcdesc = arcpy.da.Describe(fc)
    dtype = fcdesc["dataType"]
    name = fcdesc["name"]
    stype = fcdesc["shapeType"]
    print(f"{dtype} {name} has shapetype {stype}")

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arc
nt/week7/data/Ex06/list_data.py
['amtrak_stations.shp', 'cities.shp', 'counties.shp', 'new_mexico.shp', 'railroads.shp']
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/arc
nt/week7/data/Ex06/list_data.py
ShapeFile amtrak_stations.shp has shapetype Point
ShapeFile cities.shp has shapetype Point
ShapeFile counties.shp has shapetype Polygon
ShapeFile new_mexico.shp has shapetype Polygon
ShapeFile railroads.shp has shapetype Polyline
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7>
```

list_copy.py

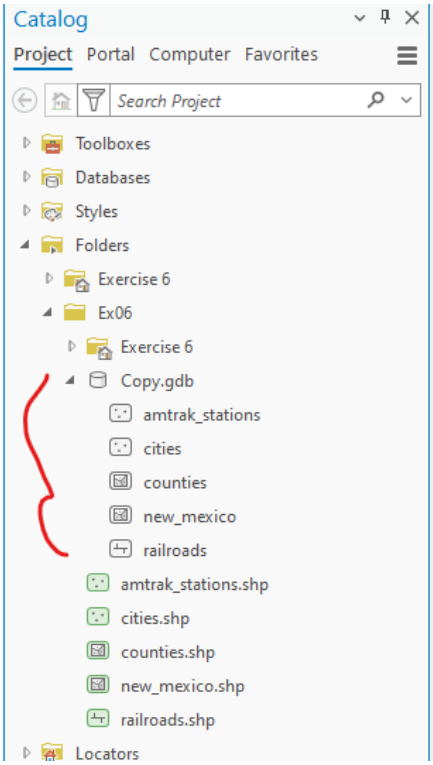
data > Ex06 > list_copy.py > ...

```python
import arcpy
import os
ws = r"C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7\data\Ex06"
fgdb = "Copy.gdb"
arcpy.CreateFileGDB_management(ws, fgdb)
arcpy.env.workspace = ws
fclist = arcpy.ListFeatureClasses()
for fc in fclist:
    fcname = arcpy.da.Describe(fc)["baseName"]
    newfc = os.path.join(ws, fgdb, fcname)
    arcpy.CopyFeatures_management(fc, newfc)

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin
nt/week7/data/Ex06/list_data.py
['amtrak_stations.shp', 'cities.shp', 'counties.shp', 'new_mexico.shp', 'railroads.shp']
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin
nt/week7/data/Ex06/list_data.py
ShapeFile amtrak_stations.shp has shapetype Point
ShapeFile cities.shp has shapetype Point
ShapeFile counties.shp has shapetype Polygon
ShapeFile new_mexico.shp has shapetype Polygon
ShapeFile railroads.shp has shapetype Polyline
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin
nt/week7/data/Ex06/list_copy.py
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7>
```


Catalog
Project
Portal
Computer
Favorites
Search Project
Toolboxes
Databases
Styles
Folders
Exercise 6
Ex06
Exercise 6
Copy.gdb
amtrak_stations
cities
counties
new_mexico
railroads
amtrak_stations.shp
cities.shp
counties.shp
new_mexico.shp
railroads.shp
Locators

list_fields.py

data > Ex06 > list_fields.py > ...

```python
import arcpy
arcpy.env.overwriteOutput = True
arcpy.env.workspace = r"C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7\data\Ex06"
fieldlist = arcpy.ListFields("cities.shp")
for field in fieldlist:
    print(field.name + "" + field.type)

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/ar
nt/week7/data/Ex06/list_data.py
['amtrak_stations.shp', 'cities.shp', 'counties.shp', 'new_mexico.shp', 'railroads.shp']
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/ar
nt/week7/data/Ex06/list_data.py
ShapeFile amtrak_stations.shp has shapetype Point
ShapeFile cities.shp has shapetype Point
ShapeFile counties.shp has shapetype Polygon
ShapeFile new_mexico.shp has shapetype Polygon
ShapeFile railroads.shp has shapetype Polyline
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/ar
nt/week7/data/Ex06/list_copy.py
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7> & "C:/Program Files/ArcGIS/Pro/bin/Python/envs/ar
nt/week7/data/Ex06/list_fields.py
FIDOID
ShapeGeometry
CITIESX020Double
FEATUREString
NAMEString
POP_RANGEString
POP_2000Integer
FIPS55String
COUNTYString
FIPSString
STATEString
STATE_FIPSString
DISPLAYSmallInteger
PS C:\ProgrammingProjects\GISC2335_ProgrammingForGIS\WeeklyContent\week7>
```

Manipulate lists

Python

```
arcpy.env.workspace = r"C:\ProgrammingProjects
\GISC2335_ProgrammingForGIS\WeeklyContent\week7
\data\Ex06\Copy.gdb"
fclist = arcpy.ListFeatureClasses()
print(fclist)
['amtrak_stations', 'cities', 'counties',
'new_mexico', 'railroads']
```

Python

```
fclist[0]
'amtrak_stations'
fclist[-1]
'railroads'
fclist[1:3]
['cities', 'counties']
fclist[2:]
['counties', 'new_mexico', 'railroads']
cities = ["Alameda", "Brazos", "Chimayo",
"Dulce"]
len(cities)
4
del cities[2]
print(cities)
['Alameda', 'Brazos', 'Dulce']
cities.sort()
print(cities)
['Alameda', 'Brazos', 'Dulce']
```

```
cities.sort(reverse = True)
print(cities)
['Dulce', 'Brazos', 'Alameda']
"zuni" in cities
False
cities.append("Zuni")
print(cities)
['Dulce', 'Brazos', 'Alameda', 'Zuni']
cities.insert(0, "Espanola")
print(cities)
['Espanola', 'Dulce', 'Brazos', 'Alameda',
'Zuni']
```

Work with dictionaries

Python

```
False
cities.append("Zuni")
print(cities)
['Dulce', 'Brazos', 'Alameda', 'Zuni']
cities.insert(0, "Espanola")
print(cities)
['Espanola', 'Dulce', 'Brazos', 'Alameda',
'Zuni']
countylookup = {"Alameda": "Bernalillo County",
"Brazos": "Rio Arriba County", "Chimayo":
"Santa Fe County"}
countylookup["Brazos"]
'Rio Arriba County'
countylookup["Santa Fe County"]
Traceback (most recent call last):
  File "<string>", line 1, in <module>
KeyError: 'Santa Fe County'
len(countylookup)
3
list(countylookup.keys())
['Alameda', 'Brazos', 'Chimayo']
list(countylookup.values())
['Bernalillo County', 'Rio Arriba County',
'Santa Fe County']
```

End of exercise 6