In [1]:
```
import requests
import shutil
import pandas as pd
import geopandas as gpd
import os
from shapely.geometry import Point
```

In [2]:
```
NDAWN_Geofolder_new = r'C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3'
if not os.path.exists(NDAWN_Geofolder_new):
    os.mkdir(NDAWN_Geofolder_new)

#List for URL to iterate
variable = ['ddavt', 'ddmxt', 'ddmnt']

for Var in variable:
    #retrieves CSV data from the NDAWN website for weather stations and date range
    dataurl = fr'https://ndawn.ndsu.nodak.edu/table.csv?station=78&station=111&station
    NDAWNoutput = fr'C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\NDAWN_{Var
    NDAWN_Geo_Get = requests.get(dataurl, verify=False, stream=True) #get request func
    #saving the downloaded data to the local file system.
    with open(NDAWNoutput, 'wb') as file:
        file.write(NDAWN_Geo_Get.content)
   #Clean Data
    NDAWNoutput = fr'C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\NDAWN_{Var

    #The provided code reads a CSV file into a pandas DataFrame, skips the first 4 row
    North_Dogg_Dataframe = pd.read_csv(fr'C:\Users\Track\OneDrive\Documents\ArcGIS\Pro
    new_names = ['Location', 'Latitude', 'Longitude', 'Elevation', 'Year', 'Month', 'D
    North_Dogg_Dataframe.columns = new_names
    North_Dogg_Dataframe

    # Group the data by the 'Location' column and calculate the average temperature fo
    monthly_avg_temp = North_Dogg_Dataframe.groupby(['Latitude', 'Longitude', 'Locatio

    # Convert to DataFrame
    monthly_avg_temp_df = monthly_avg_temp.reset_index()

    # Save the result to a CSV file
    output_csv = fr'C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\monthly_avg
    monthly_avg_temp_df.to_csv(output_csv, index=False)

    # Print the result
    print(monthly_avg_temp_df)

    #creates pionts on map hehe
    arcpy.management.XYTableToPoint(
        in_table=fr"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\monthly_avg
        out_feature_class=fr"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\La
        x_field="Longitude",
        y_field="Latitude",
        z_field=None,
        coordinate_system='GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984
    )
```

```
C:\Users\Track\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone\lib\site-packages\urllib3\connectionpool.py:1056: InsecureRequestWarning: Unverified HTTPS request is being made to host 'ndawn.ndsu.nodak.edu'. Adding certificate verification is strongly advised. See: https://urllib3.readthedocs.io/en/1.26.x/advanced-usage.html#ssl-warnings
  warnings.warn(
```

	Latitude	Longitude	Location	ddavt
0	44.68768	-92.85985	Hastings	44.589867
1	45.25334	-95.97341	Holloway	42.329367
2	45.34399	-93.85014	Becker	43.386867
3	45.71509	-95.17179	Westport	40.773833
4	45.79384	-94.26182	Rice	42.007567
..	...	...	...	...
188	48.88351	-97.15029	Humboldt	36.049833
189	48.89141	-98.62842	Wales	33.915000
190	48.96375	-103.80585	Fortuna	36.064900
191	48.98128	-102.52419	Portal	34.843933
192	48.99821	-100.06389	Peace Garden	33.733700

[193 rows x 4 columns]

```
C:\Users\Track\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone\lib\site-packages\urllib3\connectionpool.py:1056: InsecureRequestWarning: Unverified HTTPS request is being made to host 'ndawn.ndsu.nodak.edu'. Adding certificate verification is strongly advised. See: https://urllib3.readthedocs.io/en/1.26.x/advanced-usage.html#ssl-warnings
  warnings.warn(
```

	Latitude	Longitude	Location	ddmxt
0	44.68768	-92.85985	Hastings	53.571967
1	45.25334	-95.97341	Holloway	53.248867
2	45.34399	-93.85014	Becker	52.395800
3	45.71509	-95.17179	Westport	50.177100
4	45.79384	-94.26182	Rice	51.065500
..	...	...	...	...
188	48.88351	-97.15029	Humboldt	44.040200
189	48.89141	-98.62842	Wales	42.234733
190	48.96375	-103.80585	Fortuna	44.430567
191	48.98128	-102.52419	Portal	43.669833
192	48.99821	-100.06389	Peace Garden	40.583233

[193 rows x 4 columns]

```
C:\Users\Track\AppData\Local\ESRI\conda\envs\arcgispro-py3-clone\lib\site-packages\urllib3\connectionpool.py:1056: InsecureRequestWarning: Unverified HTTPS request is being made to host 'ndawn.ndsu.nodak.edu'. Adding certificate verification is strongly advised. See: https://urllib3.readthedocs.io/en/1.26.x/advanced-usage.html#ssl-warnings
  warnings.warn(
```

	Latitude	Longitude	Location	ddmnt
0	44.68768	-92.85985	Hastings	35.607333
1	45.25334	-95.97341	Holloway	31.409433
2	45.34399	-93.85014	Becker	34.377600
3	45.71509	-95.17179	Westport	31.370133
4	45.79384	-94.26182	Rice	32.949200
..	...	...	...	...
188	48.88351	-97.15029	Humboldt	28.059000
189	48.89141	-98.62842	Wales	25.594833
190	48.96375	-103.80585	Fortuna	27.698833
191	48.98128	-102.52419	Portal	26.017533
192	48.99821	-100.06389	Peace Garden	26.883767

[193 rows x 4 columns]

In [9]:
```
#Kriging Minimum
arcpy.ddd.Kriging(
    in_point_features="monthly_avg_temperaturesddmnt_XYTableToPoint",
    z_field="ddmnt",
    out_surface_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.g
    semiVariogram_props="Spherical # # # #",
    cell_size=0.0172421199999999,
    search_radius="VARIABLE 12",
    out_variance_prediction_raster=None
)
#Kriging Max
arcpy.ddd.Kriging(
    in_point_features="monthly_avg_temperaturesddmxt_XYTableToPoint",
    z_field="ddmxt",
    out_surface_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.g
    semiVariogram_props="Spherical # # # #",
    cell_size=0.0172421199999999,
    search_radius="VARIABLE 12",
    out_variance_prediction_raster=None
)
#Kriging Avg
arcpy.ddd.Kriging(
    in_point_features="monthly_avg_temperaturesddavt_XYTableToPoint",
    z_field="ddavt",
    out_surface_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.g
    semiVariogram_props="Spherical # # # #",
    cell_size=0.0172421199999999,
    search_radius="VARIABLE 12",
    out_variance_prediction_raster=None
)
```

Out[9]:

Messages

In [10]:
```
#Diffusion Min
arcpy.ga.DiffusionInterpolationWithBarriers(
    in_features="monthly_avg_temperaturesddmnt_XYTableToPoint",
    z_field="ddmnt",
    out_ga_layer=None,
    out_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.gdb\Dif
    cell_size=0.0172421199999999,
    in_barrier_features=None,
```

```
    bandwidth=None,
    number_iterations=100,
    weight_field=None,
    in_additive_barrier_raster=None,
    in_cumulative_barrier_raster=None,
    in_flow_barrier_raster=None
)
#Diffusion Max
arcpy.ga.DiffusionInterpolationWithBarriers(
    in_features="monthly_avg_temperaturesddmxt_XYTableToPoint",
    z_field="ddmxt",
    out_ga_layer=None,
    out_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.gdb\Dif
    cell_size=0.0172421199999999,
    in_barrier_features=None,
    bandwidth=None,
    number_iterations=100,
    weight_field=None,
    in_additive_barrier_raster=None,
    in_cumulative_barrier_raster=None,
    in_flow_barrier_raster=None
)
#Diffusion Average
arcpy.ga.DiffusionInterpolationWithBarriers(
    in_features="monthly_avg_temperaturesddavt_XYTableToPoint",
    z_field="ddavt",
    out_ga_layer=None,
    out_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.gdb\Dif
    cell_size=0.0172421199999999,
    in_barrier_features=None,
    bandwidth=None,
    number_iterations=100,
    weight_field=None,
    in_additive_barrier_raster=None,
    in_cumulative_barrier_raster=None,
    in_flow_barrier_raster=None
)
```

Out[10]:

Messages

In [11]:

```
#IDW MIN
arcpy.ddd.Idw(
    in_point_features="monthly_avg_temperaturesddmnt_XYTableToPoint",
    z_field="ddmnt",
    out_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.gdb\Id
    cell_size=0.0172421199999999,
    power=2,
    search_radius="VARIABLE 12",
    in_barrier_polyline_features=None
)
#IDW Max
arcpy.ddd.Idw(
    in_point_features="monthly_avg_temperaturesddmxt_XYTableToPoint",
    z_field="ddmxt",
    out_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.gdb\Id
```

```
    cell_size=0.0172421199999999,
    power=2,
    search_radius="VARIABLE 12",
    in_barrier_polyline_features=None
)
#IDW Avg
arcpy.ddd.Idw(
    in_point_features="monthly_avg_temperaturesddavt_XYTableToPoint",
    z_field="ddavt",
    out_raster=r"C:\Users\Track\OneDrive\Documents\ArcGIS\Projects\Lab3\Lab3.gdb\Id
    cell_size=0.0172421199999999,
    power=2,
    search_radius="VARIABLE 12",
    in_barrier_polyline_features=None
)
```

Out[11]:

Messages

In [ ]: