NDAWNETL

November 29, 2022

1 Necessary Modules Needed to Import and Extract NDAWN Temperature Data

[1]:
```
import arcpy
import io
import os
import requests
```

2 ETL for Gathering Last 30 Days of Averaged Temperature Across All Stations and Applying Interpolation Methods

[19]:
```
NDAWN_Last30Days = "https://ndawn.ndsu.nodak.edu/get-table.html?
↪station=78&station=111&station=98&station=174&station=142&station=138&station=161&station=9
```

[20]:
```
NDAWN_Last30Days
```

[20]:
```
'https://ndawn.ndsu.nodak.edu/get-table.html?station=78&station=111&station=98&s
tation=174&station=142&station=138&station=161&station=9&station=10&station=118&
station=56&station=11&station=12&station=58&station=13&station=84&station=55&sta
tion=7&station=87&station=14&station=15&station=96&station=16&station=137&statio
n=124&station=143&station=17&station=85&station=140&station=134&station=18&stati
on=136&station=65&station=104&station=99&station=19&station=129&station=20&stati
on=101&station=81&station=21&station=97&station=22&station=75&station=2&station=
172&station=139&station=23&station=62&station=86&station=24&station=89&station=1
26&station=93&station=90&station=25&station=83&station=107&station=156&station=7
7&station=26&station=70&station=127&station=27&station=132&station=28&station=29
&station=30&station=31&station=102&station=32&station=119&station=4&station=80&s
tation=33&station=59&station=105&station=82&station=34&station=72&station=135&st
ation=35&station=76&station=120&station=141&station=109&station=36&station=79&st
ation=71&station=37&station=38&station=39&station=130&station=73&station=40&stat
ion=41&station=54&station=69&station=113&station=128&station=42&station=43&stati
on=103&station=116&station=88&station=114&station=3&station=163&station=64&stati
on=115&station=67&station=44&station=133&station=106&station=100&station=121&sta
tion=45&station=46&station=61&station=66&station=74&station=60&station=125&stati
on=8&station=47&station=122&station=108&station=5&station=152&station=48&station
```

```
=68&station=49&station=50&station=91&station=117&station=63&station=150&station=
51&station=6&station=52&station=92&station=112&station=131&station=123&station=9
5&station=53&station=57&station=149&station=148&station=110&variable=ddavt&year=
2022&ttype=daily&quick_pick=30_d&begin_date=2022-11-18&end_date=2022-11-18'
```

[21]:
```
request_URL = "https://ndawn.ndsu.nodak.edu/table.csv?
↪station=78&station=111&station=98&station=174&station=142&station=138&station=161&station=9
```

[10]:
```
BaseNDAWN_URL = "https://ndawn.ndsu.nodak.edu/get-table.html?
↪station=78&station=111&station=98&station=174&station=142&station=138&station=161&station=9
```

[11]:
```
Parameters = {
    "station" : "110",
    "variable" : "ddvat",
    "year" : "2022",
    "ttype" : "daily",
    "quick_pick" : "30_d",
    "begin_date" : "2022-11-18",
    "end_date" : "2022-11-18",
}
```

[13]:
```
Request_Response = requests.get(BaseNDAWN_URL, params  = Parameters)
with open("C:\\Users\\Alexander Danielson\\Desktop\\Fall 2022Spring2023\\ArcGIS␣
↪I\\Lab3\\Lab3\\NDAWN30.csv" , "w") as newCSV_txt:
    newCSV_txt.write(Request_Response.content.decode('utf-8'))
```

2.1 Create Custom Table for XY Table to Point for Mapping Interpolation Points

[1]:
```
arcpy.management.XYTableToPoint(r"C:\Users\Alexander Danielson\Desktop\Fall␣
↪2022Spring2023\ArcGIS I\Lab3\Lab3\NDAWN30.csv", r"C:\Users\Alexander␣
↪Danielson\Desktop\Fall 2022Spring2023\ArcGIS I\Lab3\Lab3\Lab3.
↪gdb\NDAWN30_XYTableToPoint", "Longitude", "Latitude", None,␣
↪'GEOGCS["GCS_WGS_1984",DATUM["D_WGS_1984",SPHEROID["WGS_1984",6378137.0,298.
↪257223563]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]];-400␣
↪-400 1000000000;-100000 10000;-100000 10000;8.98315284119521E-09;0.001;0.001;
↪IsHighPrecision')
```

[1]:
```
<Result 'C:\\Users\\Alexander Danielson\\Desktop\\Fall 2022Spring2023\\ArcGIS
I\\Lab3\\Lab3\\Lab3.gdb\\NDAWN30_XYTableToPoint'>
```

2.2 Run IDW Tool for Comparison of Interpolation Method One

[2]:
```
arcpy.ddd.Idw("NDAWN30_XYTableToPoint", "Avg_Temp", r"C:\Users\Alexander␣
↪Danielson\Desktop\Fall 2022Spring2023\ArcGIS I\Lab3\Lab3\Lab3.
↪gdb\Idw_NDAWNAvg1", 0.0144790399999999, 2, "VARIABLE 12", None)
```

[2]:
```
<Result 'C:\\Users\\Alexander Danielson\\Desktop\\Fall 2022Spring2023\\ArcGIS I\\Lab3\\Lab3\\Lab3.gdb\\Idw_NDAWNAvg1'>
```

2.3 Run Ordinary Kriging (Spherical) Tool for Comparison of Interpolation Method Two

[3]:
```
arcpy.ddd.Kriging("NDAWN30_XYTableToPoint", "Avg_Temp", r"C:\Users\Alexander␣
↪Danielson\Desktop\Fall 2022Spring2023\ArcGIS I\Lab3\Lab3\Lab3.
↪gdb\Kriging_NDAW1", "Spherical # # # #", 0.0144790399999999, "VARIABLE 12",␣
↪None)
```

[3]:
```
<Result 'C:\\Users\\Alexander Danielson\\Desktop\\Fall 2022Spring2023\\ArcGIS I\\Lab3\\Lab3\\Lab3.gdb\\Kriging_NDAW1'>
```

2.4 Run Spline Tool for Comparison of Interpolation Method Three

[4]:
```
arcpy.ddd.Spline("NDAWN30_XYTableToPoint", "Avg_Temp", r"C:\Users\Alexander␣
↪Danielson\Desktop\Fall 2022Spring2023\ArcGIS I\Lab3\Lab3\Lab3.
↪gdb\Spline_NDAWN1", 0.0144790399999999, "REGULARIZED", 0.1, 12)
```

[4]:
```
<Result 'C:\\Users\\Alexander Danielson\\Desktop\\Fall 2022Spring2023\\ArcGIS I\\Lab3\\Lab3\\Lab3.gdb\\Spline_NDAWN1'>
```

2.5 Run Universal Kriging (Linear Drift) Tool for Comparison of Interpolation Method Four

[5]:
```
arcpy.ddd.Kriging("NDAWN30_XYTableToPoint", "Avg_Temp", r"C:\Users\Alexander␣
↪Danielson\Desktop\Fall 2022Spring2023\ArcGIS I\Lab3\Lab3\Lab3.
↪gdb\Kriging_NDAW2", "LinearDrift 0.014479 # # #", 0.0144790399999999,␣
↪"VARIABLE 12", None)
```

[5]:
```
<Result 'C:\\Users\\Alexander Danielson\\Desktop\\Fall 2022Spring2023\\ArcGIS I\\Lab3\\Lab3\\Lab3.gdb\\Kriging_NDAW2'>
```

[ ]:
```

```