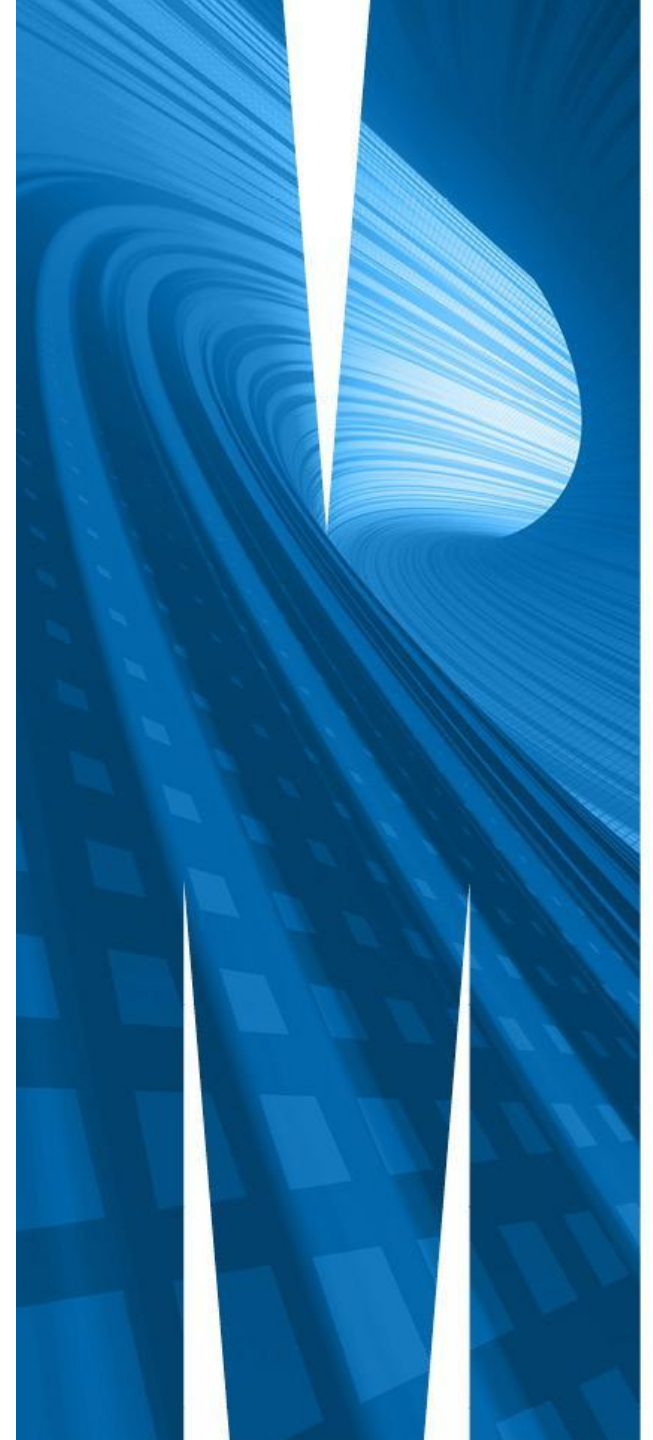
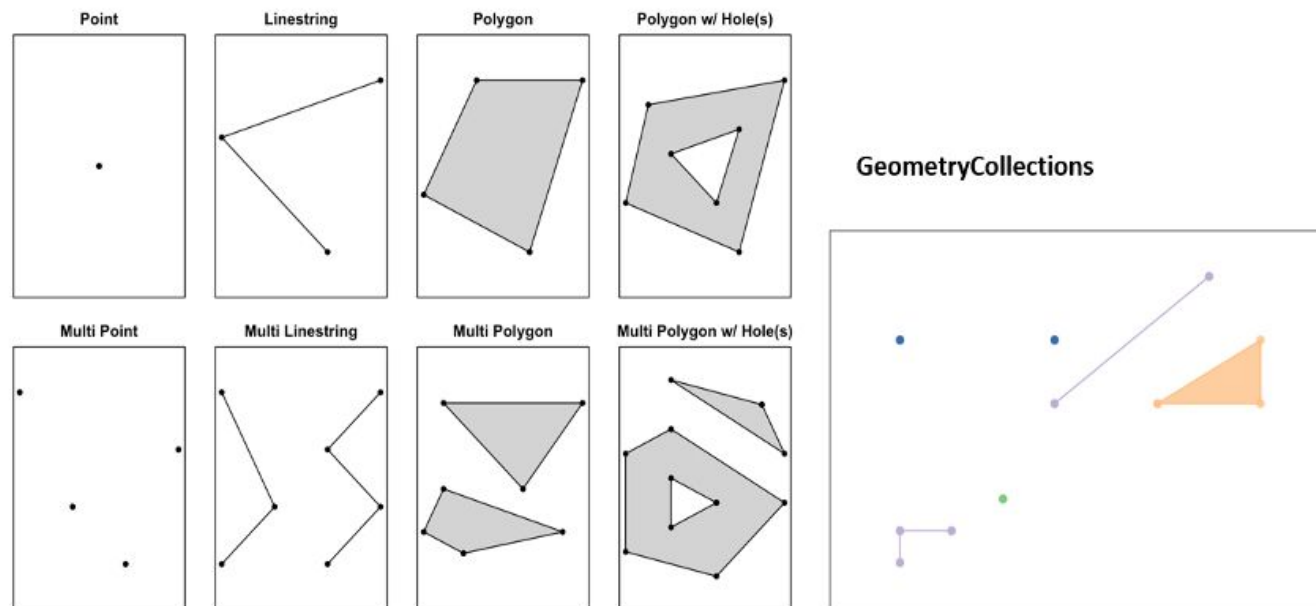


FIT3179 Data Visualisation

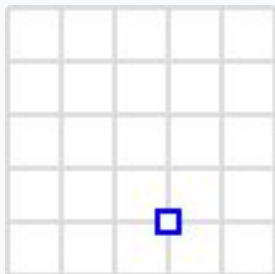
Week 8: Geographic Vector Formats



- GeoJSON is a standard format for spatial features
- Based on JSON, text file
- Points, lines, polygons and collections

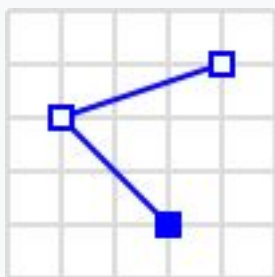


Point



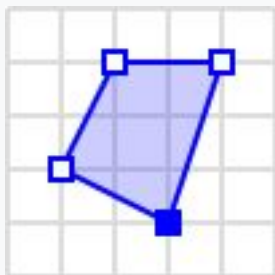
```
{  
  "type": "Point",  
  "coordinates": [30.0, 10.0]  
}
```

LineString

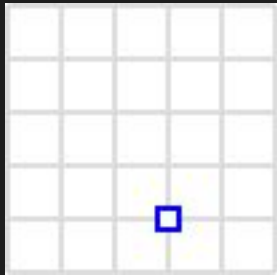


```
{  
  "type": "LineString",  
  "coordinates": [  
    [30.0, 10.0], [10.0, 30.0], [40.0, 40.0]  
  ]  
}
```

Polygon



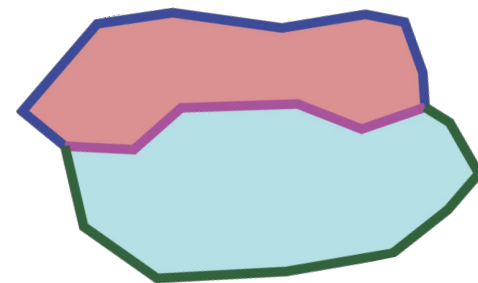
```
{  
  "type": "Polygon",  
  "coordinates": [  
    [[30.0, 10.0], [40.0, 40.0], [20.0, 40.0], [10.0, 20.0], [30.0, 10.0]]  
  ]  
}
```



```
{  
  
  "type": "Feature",  
  
  "properties": {  
  
    "name": "Coors Field",  
  
    "amenity": "Baseball Stadium",  
  
    "popupContent": "This is where the Rockies play!"  
  
  },  
  
  "geometry": {  
  
    "type": "Point",  
  
    "coordinates": [  

```

- Extension of GeoJSON
- “Topo” for topology
- Topology with geospatial data: arcs (= linestrings) are basic element. Polygons are built from arcs.
- Example: 3 arcs to form 2 polygons



- Advantages
 - Smaller size: Shared arcs are only stored once.
 - Simplification or changing of arcs results in abutting polygons.
- File format for Vega-Lite



- Format by ESRI, leader in GIS (Geographic Information System) software: ArcGIS, ArcMap
- Multiple files



ne_10m_admin_0_countries.
dbf



ne_10m_admin_0_countries.
prj

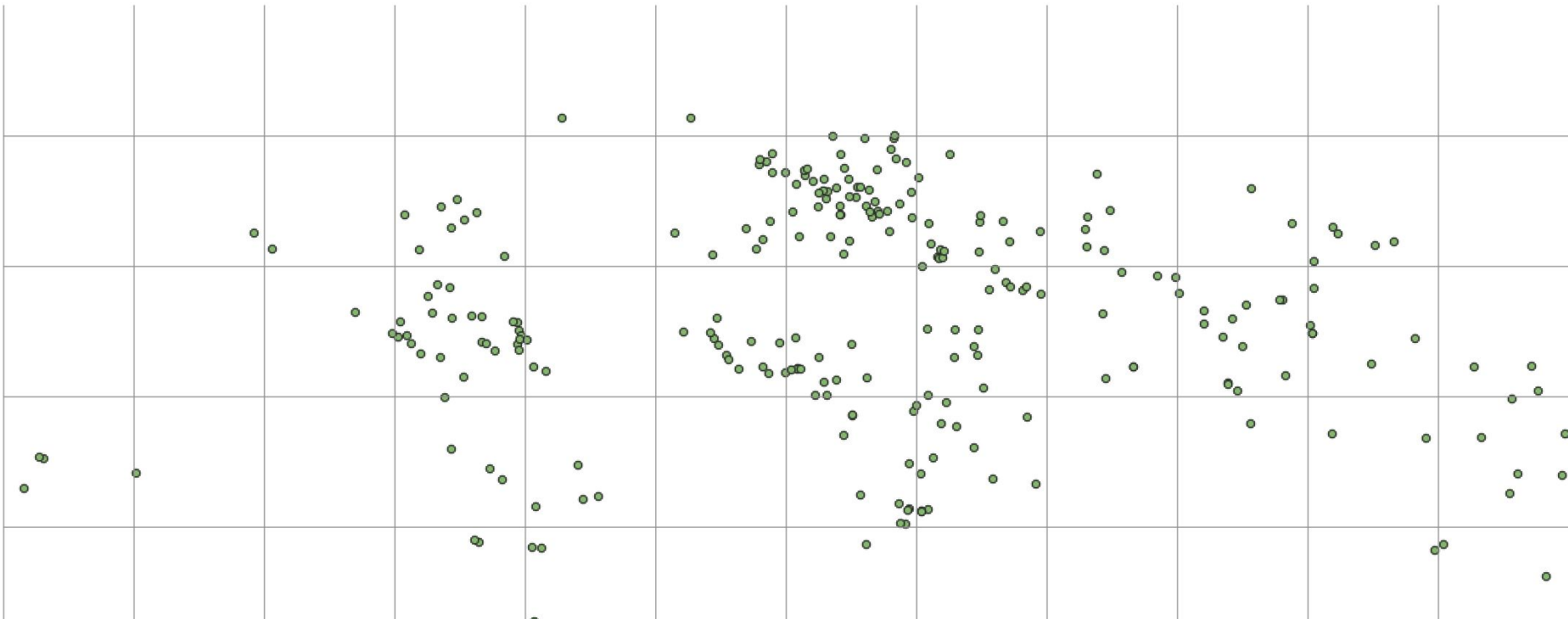


ne_10m_admin_0_countries.
shp



ne_10m_admin_0_countries.
shx

- Format by ESRI, leader in GIS (Geographic Information System) software: ArcGIS, ArcMap
- Multiple files
- Geometry in .shp file



- Format by ESRI, leader in GIS (Geographic Information System) software: ArcGIS, ArcMap
- Multiple files
- Geometry in .shp file
- Attributes in .dbf file

110m-populated-places — Features Total: 253, Filtered: 253, Selected: 0

	Name_Town	Name_Par	Name_Alt	FeatureCla	ScaleRank	NatScale	Admin_0	Admin_1	ISO_1	Sov_0	Note	POP_MAXI	POP_MINI
1	Kabul	NULL	NULL	Admin-0 capi...	3	110	Afghanistan	Kabul	AFG	Afghanistan	NULL	4803365	3720671
2	Tirana	NULL	NULL	Admin-0 capi...	3	110	Albania	Durrës	ALB	Albania	NULL	530241	530241
3	Algiers	NULL	NULL	Admin-0 capi...	3	110	Algeria	Alger	DZA	Algeria	NULL	4203253	3368320
4	Pago Pago	NULL	NULL	Admin-0 regi...	7	20	American Sa...	NULL	NULL	United States...	NULL	12576	12576
5	Andorra	NULL	NULL	Admin-0 capi...	4	50	Andorra	NULL	NULL	Andorra	NULL	53998	53998
6	Luanda	NULL	NULL	Admin-0 capi...	3	110	Angola	Luanda	AGO	Angola	NULL	1951272	1951272
7	Saint John's	NULL	NULL	Admin-0 capi...	3	110	Antigua	NULL	NULL	Antigua and ...	NULL	35499	35499
8	Buenos Aires	NULL	NULL	Admin-0 capi...	1	300	Argentina	Ciudad de Bu...	ARG	Argentina	NULL	12611862	10929146
9	Yerevan	NULL	NULL	Admin-0 capi...	3	110	Armenia	Erevan	ARM	Armenia	NULL	1200842	1200842
10	Oranjestad	NULL	NULL	Admin-0 regi...	7	20	Aruba	NULL	NULL	Netherlands	NULL	68775	68775
11	Canberra	NULL	NULL	Admin-0 capi...	3	110	Australia	Australian Ca...	AUS	Australia	NULL	244896	234032
12	Sydney	NULL	NULL	NULL	1	300	Australia	New South W...	AUS	Australia	NULL	3164008	2731457
13	Vienna	NULL	NULL	Admin-0 capi...	1	300	Austria	Wien	AUT	Austria	NULL	1610331	1561335

- Format by ESRI, leader in GIS (Geographic Information System) software
- Multiple files
- Geometry in .shp file
- Attributes in .dbf file
- Index linking geometry and attributes in .shx file
- Also other files, such as .prj for the map projection
- Keep all files in same directory
- All features in a shapefile must be of same geometry type (points, lines, polygons) and all features have the same number and types of properties (i.e. a DB table).