GIS

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Introducing GIS

- Objectives: Understanding what GIS is and what it can be used for.

- Keywords: GIS, Computer, Maps, Data, Information System, Spatial, Analysis

Introducing GIS

- Digital Data – the geographical information that you will view and analyse using computer hardware and software.
- Computer Hardware – computers used for storing data, displaying graphics and processing data.
- Computer Software – computer programs that run on the computer hardware and allow you to work with digital data. A software program that forms part of the GIS is called a GIS Application.
- People
- Procedures
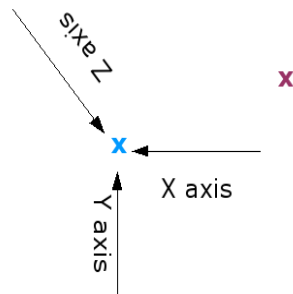
Introducing GIS

GIS Data

- Vector data
- Raster data
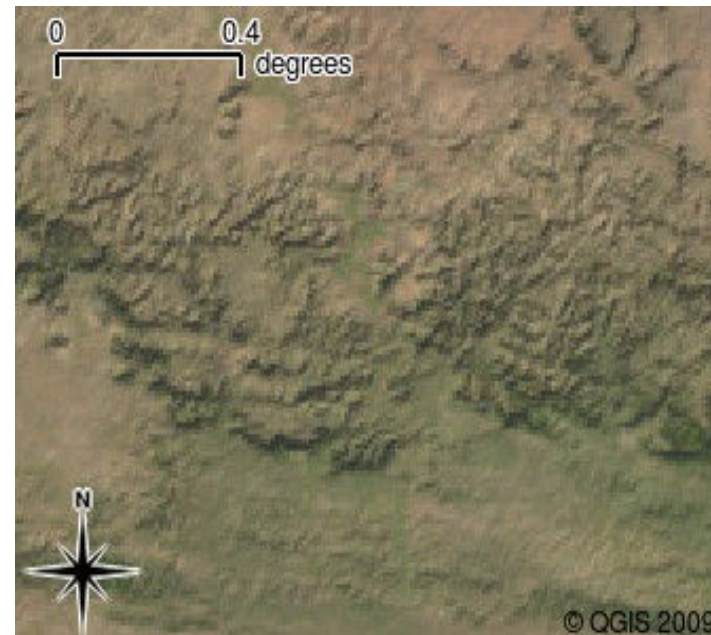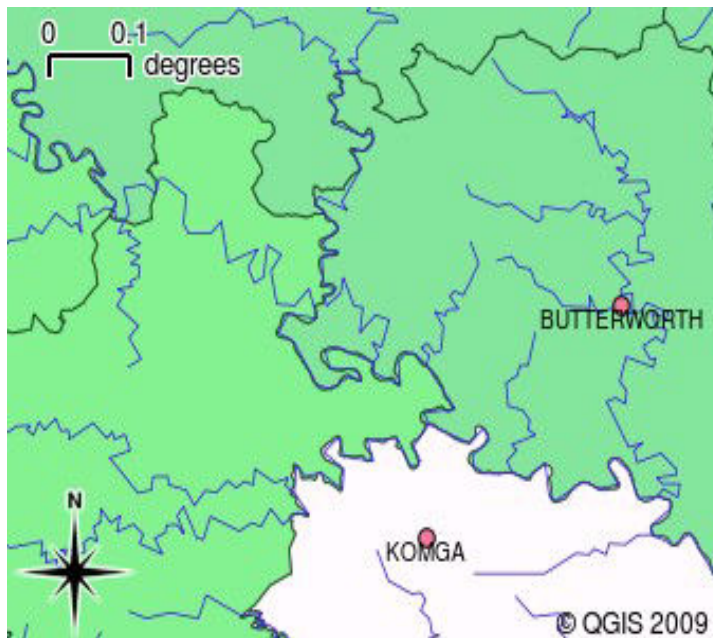
Vector data

Vector Point Feature

Point Geometry (indicates the x,y and z position of the feature)
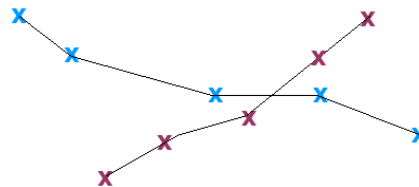
Z axis

X axis

Y axis

Point attributes (describe the feature)

Id, Name, Description

1, Tree, Outside our classroom
2, Light post, At the school entrance

Vector Polyline Feature

Polyline Geometry (a series of connected vertices that do not form an enclosed shape)
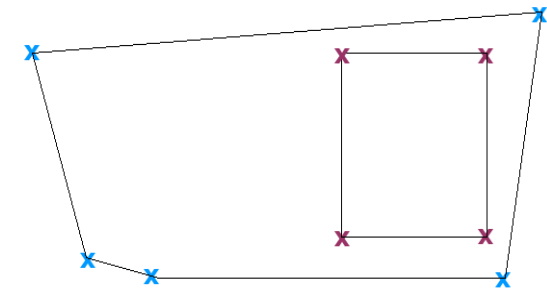
Polyline attributes (describe the feature)

Id, Name, Description

1, Footpath 1, From class to the playground
2, Footpath 2, From the school gate to the hall

Vector Polygon Feature

Polygon Geometry (a series of connected vertices that do form an enclosed shape)

**Polygon attributes (describe the feature)**

Id, Name, Description

1, School Boundary, Fenceline for the school
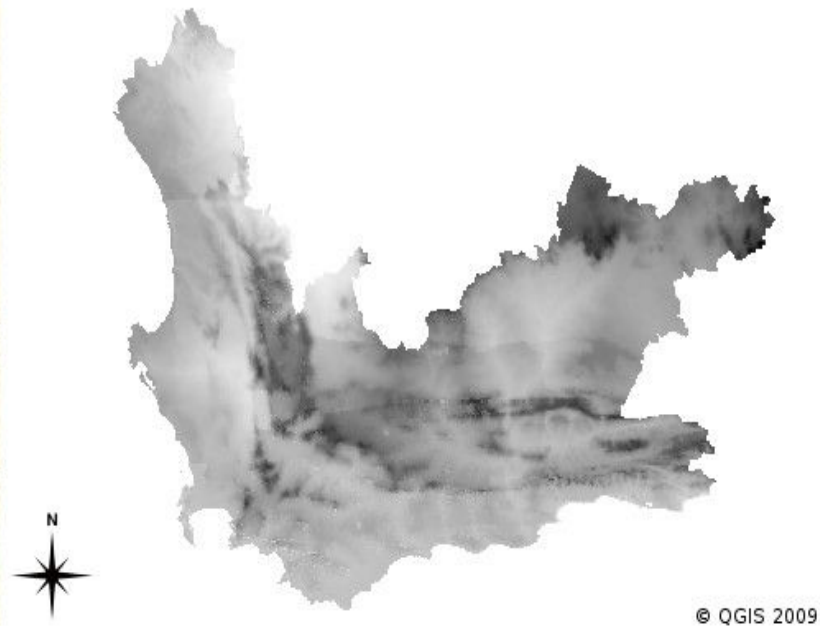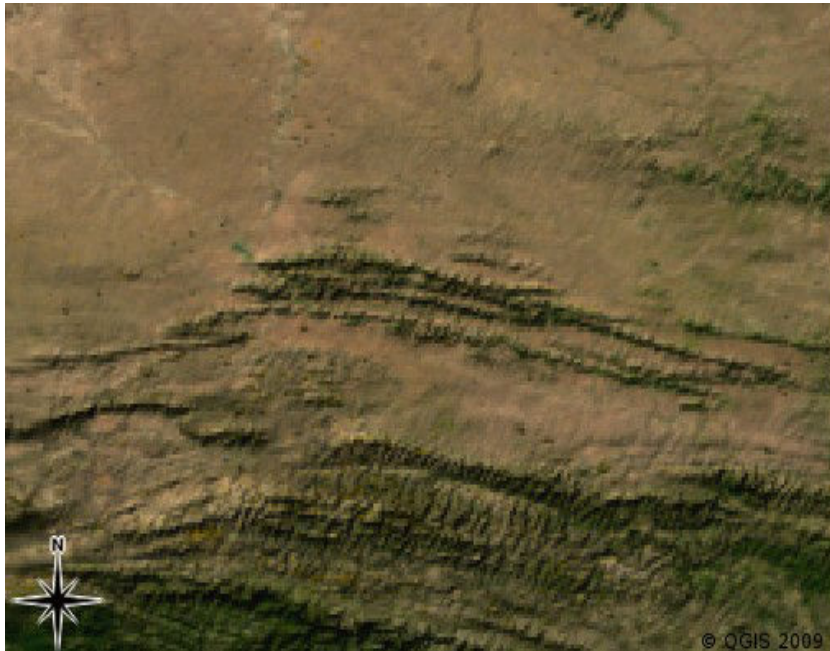2, Sports Field, We play soccer here

Data Capture

Extension	Description
.shp	The geometry of vector features are stored in this file
.dbf	The attributes of vector features are stored in this file
.shx	This file is an index that helps the GIS Application to find features more quickly.

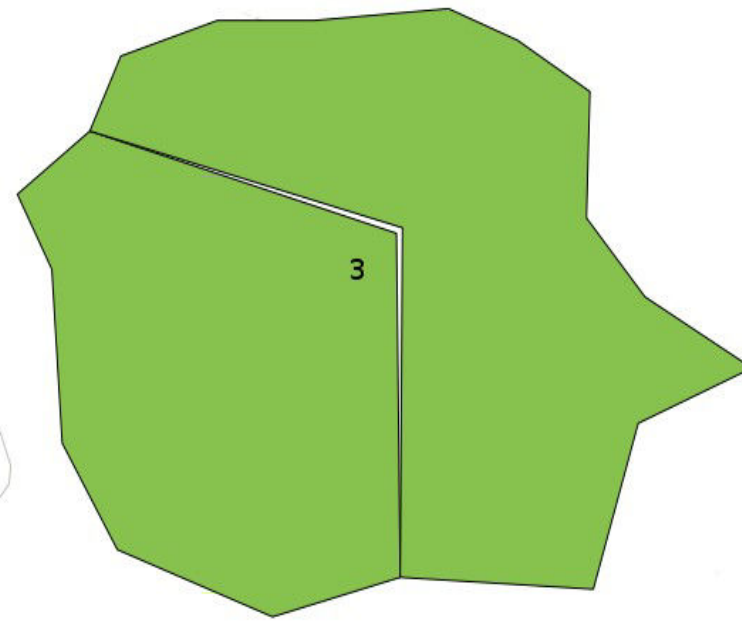# Raster Data
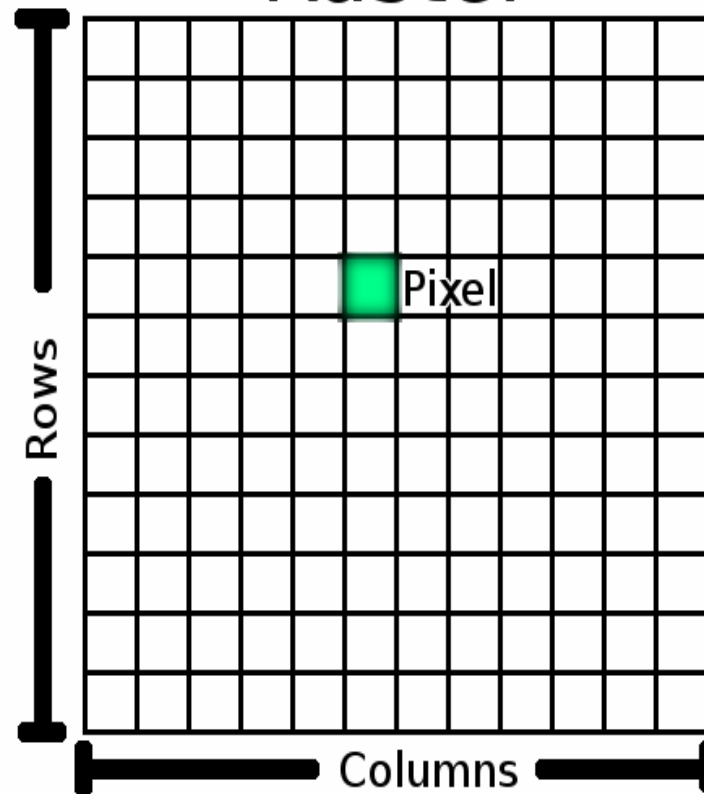
Raster Data

Raster Data

- **Georeferencing**
- **Sources of raster data**
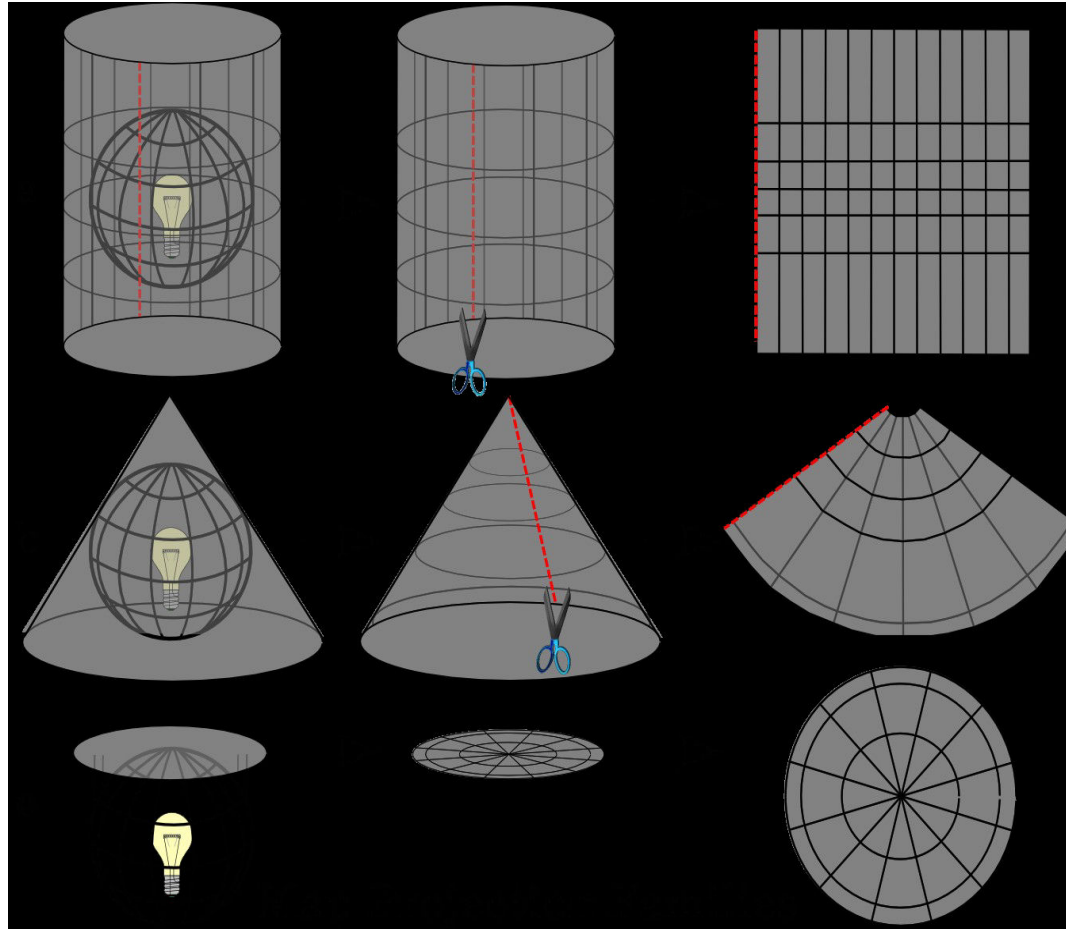- **Spatial Resolution**
- **Spectral resolution**

Topology

Topology

- **Topology rules**
- **Topological tools**
- **Snapping distance**
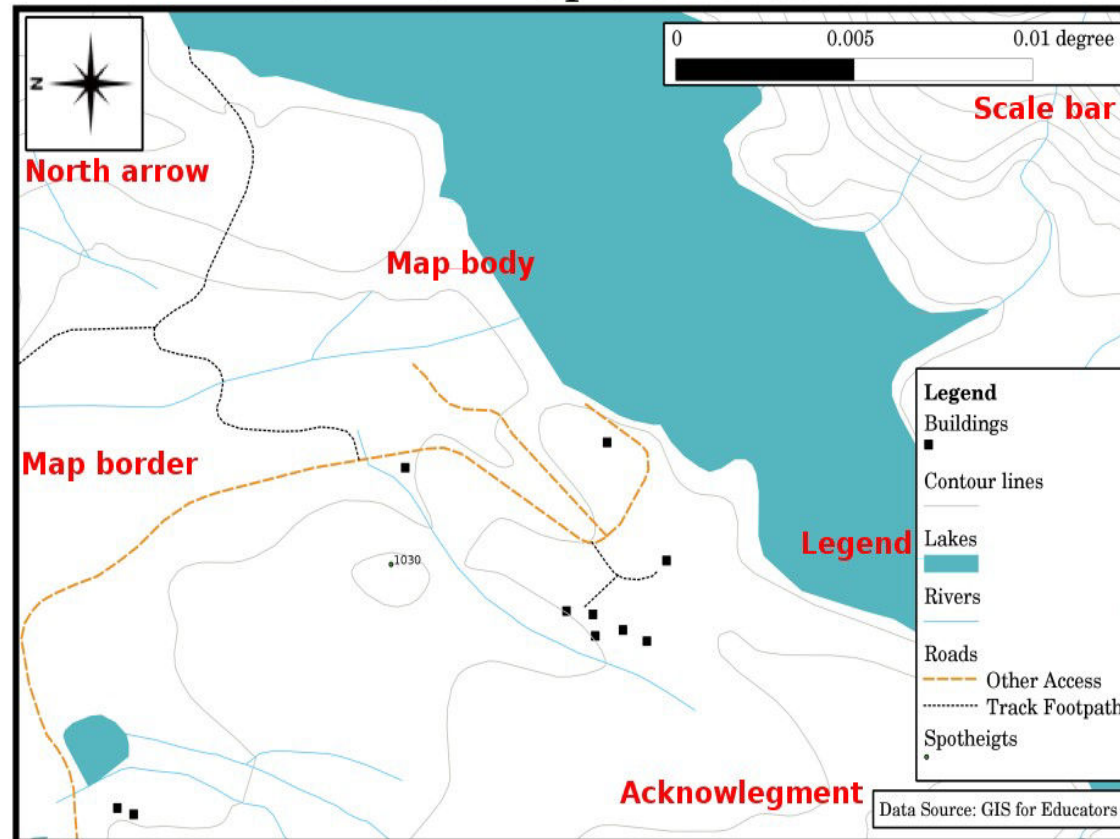
Coordinate Reference Systems

Coordinate Reference Systems

- **Map projections with angular conformity**
- **Map projections with equal distance**
- **Projections with equal areas**

# Map Production

Common map elements

Spatial analysis tools

Intersection: The output layer contains all areas where both layers overlap (intersect).

**Union**: the output layer contains all areas of the two input layers combined.

Symmetrical difference: The output layer contains all areas of the input layers except those areas where the two layers overlap (intersect).

Difference: The output layer contains all areas of the first input layer that do not overlap (intersect) with the second input layer.
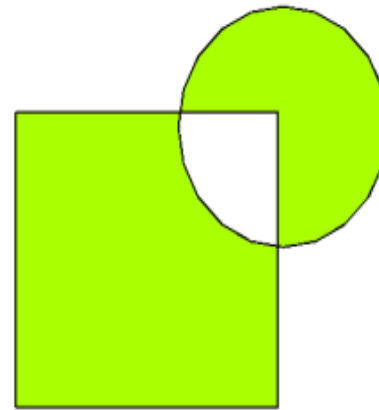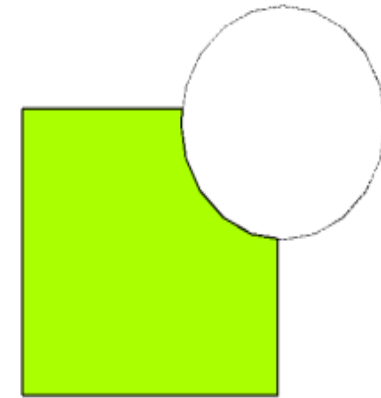
Spatial analysis tools
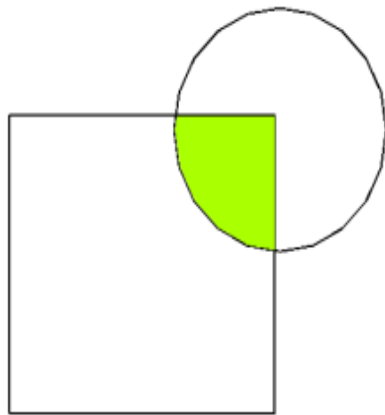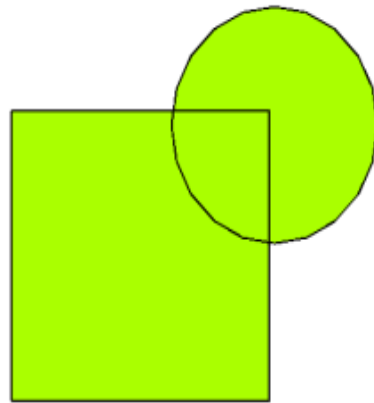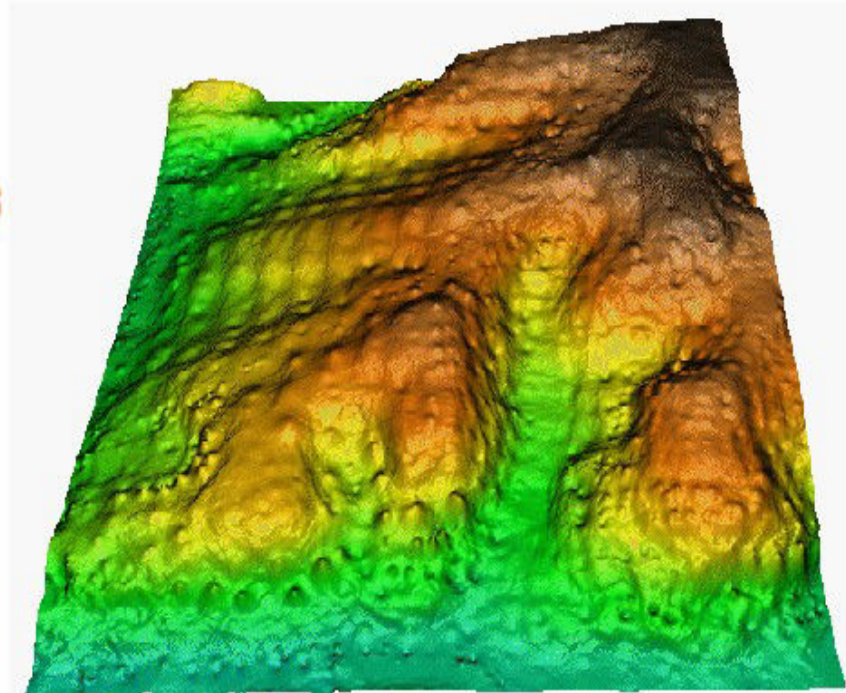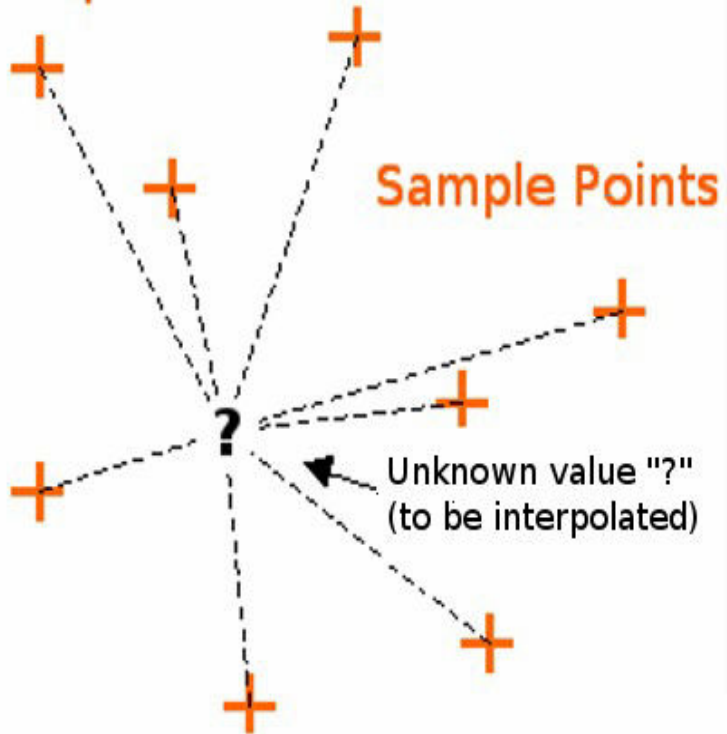

Intersection   Union   Symetrical Difference   Difference

Interpolation

Interpolation