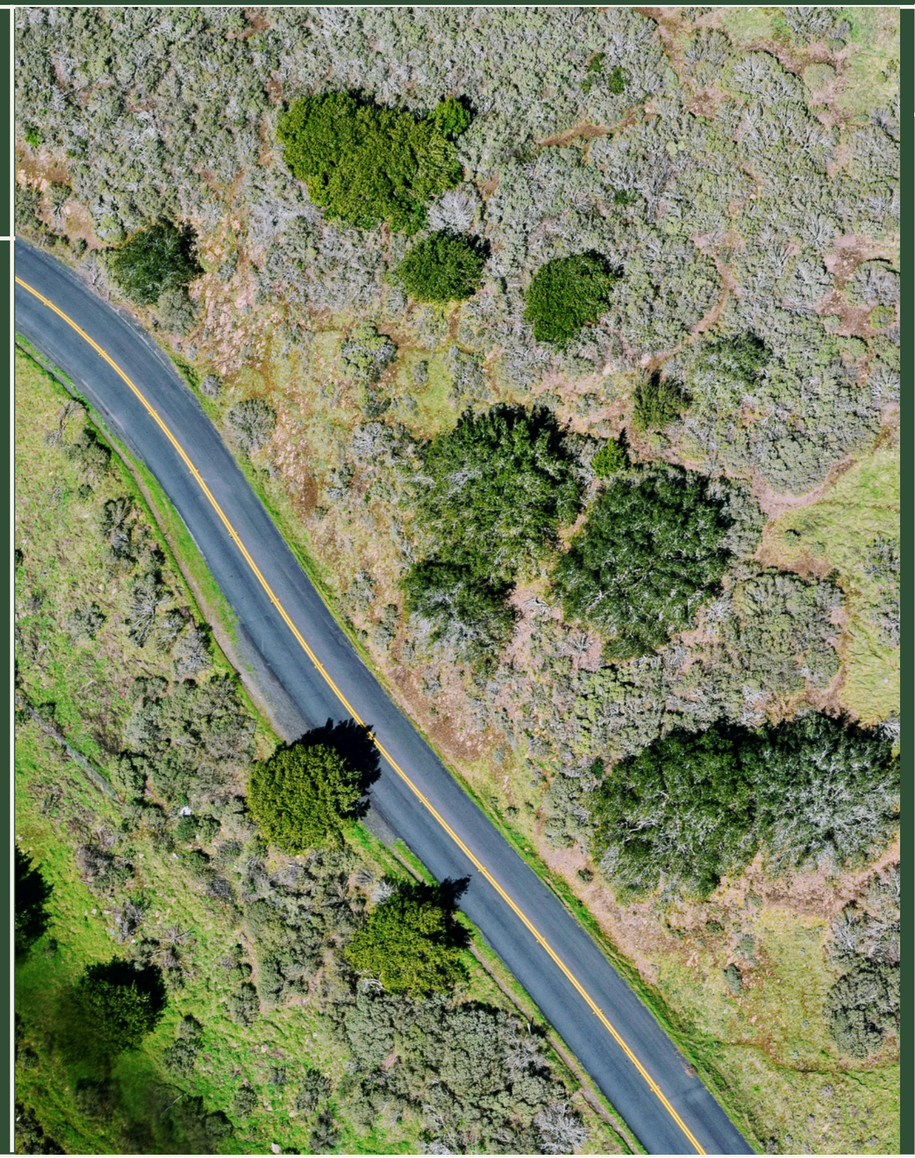
GIS – Geographical Information Services

CLASS 1 – MAPPING OURSELVES & UNDERSTANDING SPACE AND GIS

INTRODUCTION TO:

- THE COURSE
- THE LECTURER
- THE GROUP
- GIS DATA MODELS
- SPATIAL THINKING



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Geographical Information Services

A little bit about the course...

LECTURER:
DR. AYOBAMI BADIRU

PERIOD:
13.10.2025 – 06.02.2026

SCHEDULE:
MONDAYS & WEDNESDAYS, 14:00–16:00

TOTAL WORKLOAD:
180H

CONTACT HOURS:
40H (10 WEEKS × 2 SESSIONS/WEEK × 2H)

INDEPENDENT WORK:
180H (READINGS, EXERCISES,
GROUP PROJECT, PRESENTATION)

MAIN SOFTWARE:
QGIS (OPEN-SOURCE)

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COURSE STRUCTURE

Part	Focus	Approx. weight	Hours (of 40h)
I	**Introduction to GIS concepts** *(data types, and open data)*	**25%**	**10h**
II	**Spatial analysis methods in QGIS** *(building your portfolio)*	**25%**	**10h**
III	**Supervised project** *(group)*	**50%**	**20h**

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EVALUATION

Component	Description	Weight
Participation & exercises	Short practical assignments	20%
Studienleistung (mid-term)	Small analytical task	30%
Final project & presentation	Group project applying GIS	50%

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A little bit about the course...

LEARNING OUTCOMES:

- UNDERSTAND THE PRINCIPLES OF GIS AND SPATIAL DATA.
- USE QGIS FOR BASIC SPATIAL DATA MANAGEMENT, VISUALIZATION, AND ANALYSIS.
- IDENTIFY AND APPLY OPEN DATA SOURCES AND RELEVANT METADATA.
- PERFORM SIMPLE SPATIAL ANALYSES AND INTERPRET THEIR OUTPUTS.
- DESIGN, EXECUTE, AND PRESENT A SMALL GIS PROJECT ADDRESSING AN ENVIRONMENTAL OR URBAN ISSUE.

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A little bit about me...

CLIMATE SCIENTIST AND GIS ANALYST

PHD IN PHYSICAL GEOGRAPHY (UFPE, BRAZIL & UNIVERSITÉ RENNES 2, FRANCE).

RESEARCHER AT THE ENVIRONMENTAL METEOROLOGY DEPARTMENT, UNIVERSITY OF FREIBURG.

WORK WITH CLIMATE AND GEOSPATIAL DATA, FOCUSING ON VULNERABILITY, RESILIENCE, AND CLIMATE CHANGE.

PASSIONATE ABOUT CONNECTING MAPS, PEOPLE, AND NARRATIVES.

... ALSO PASSIONATE ABOUT ARTS 🤍

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A little bit about you...

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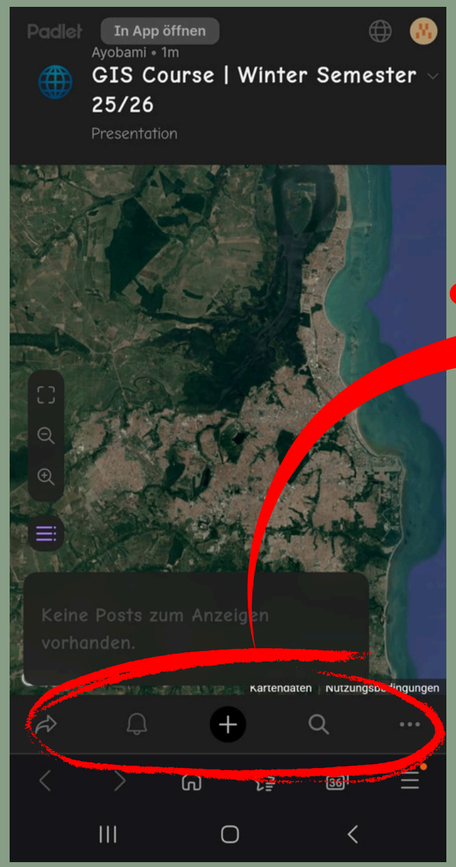

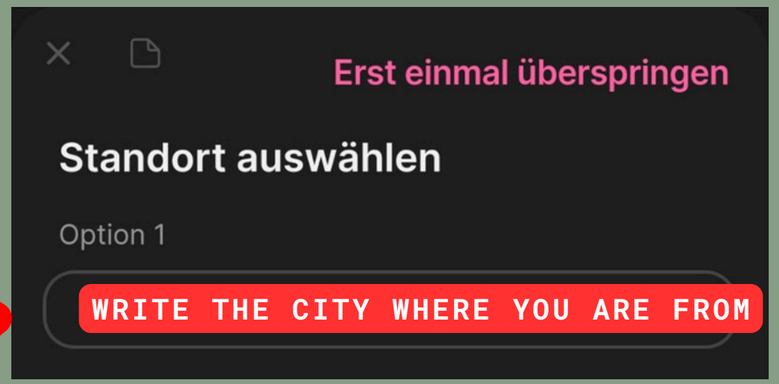

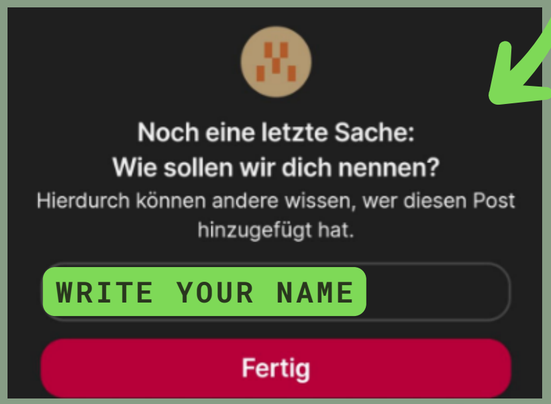

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A little bit about you...

Your **name...**

Your **experience** with maps or spatial data

Your **background** or field of **study**

...something else you want to **share**

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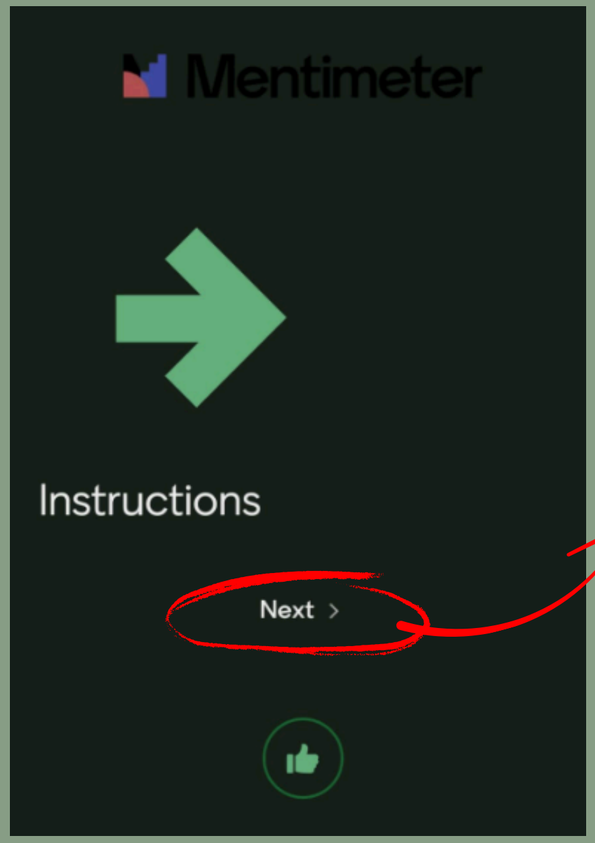
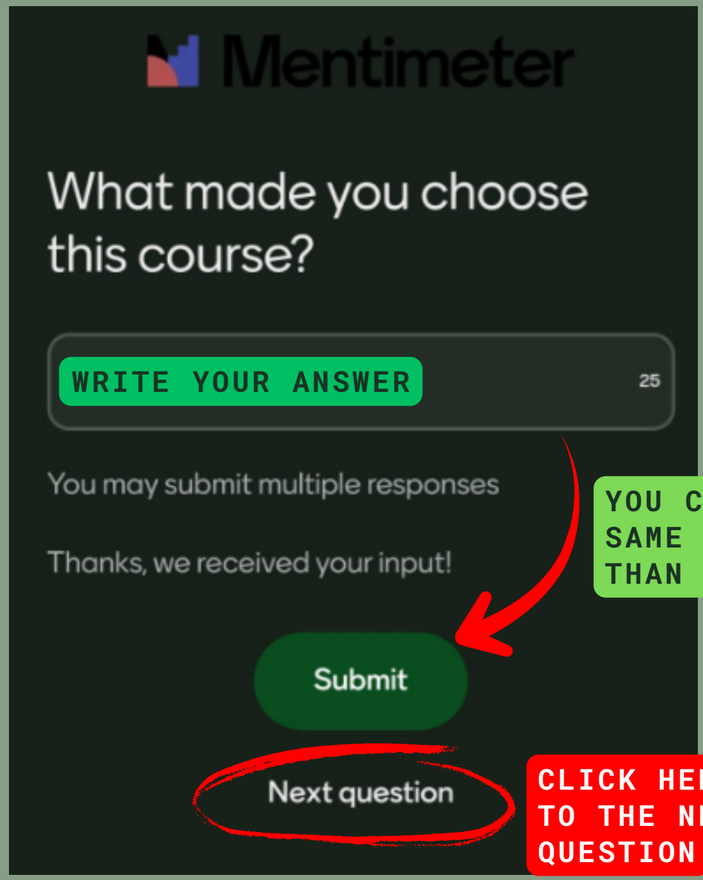
A little bit about the group...

Scan the code

Or go to:
www.menti.com

Code: 4106 5113





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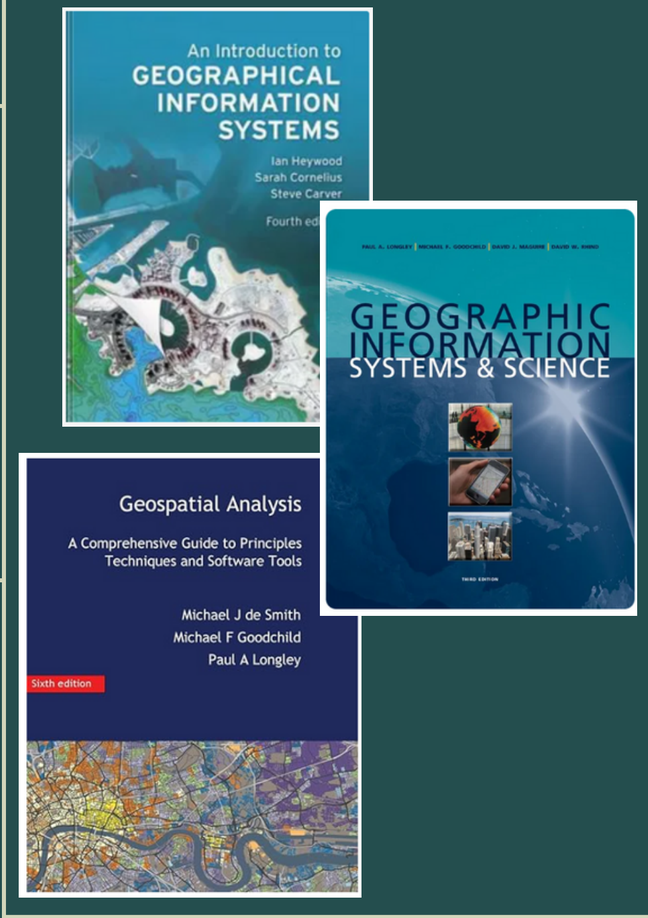

Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2021). **Geographic Information Systems and Science** (5th ed.). Wiley.

Heywood, I., Cornelius, S., & Carver, S. (2011). An **Introduction to Geographical Information Systems** (4th ed.). Pearson.

de Smith, M. J., Goodchild, M. F., & Longley, P. (2022). **Geospatial Analysis: A Comprehensive Guide**. https://www.spatialanalysisonline.com

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HTTPS://WWW.**QGIS.ORG/RESOURCES/HUB/**

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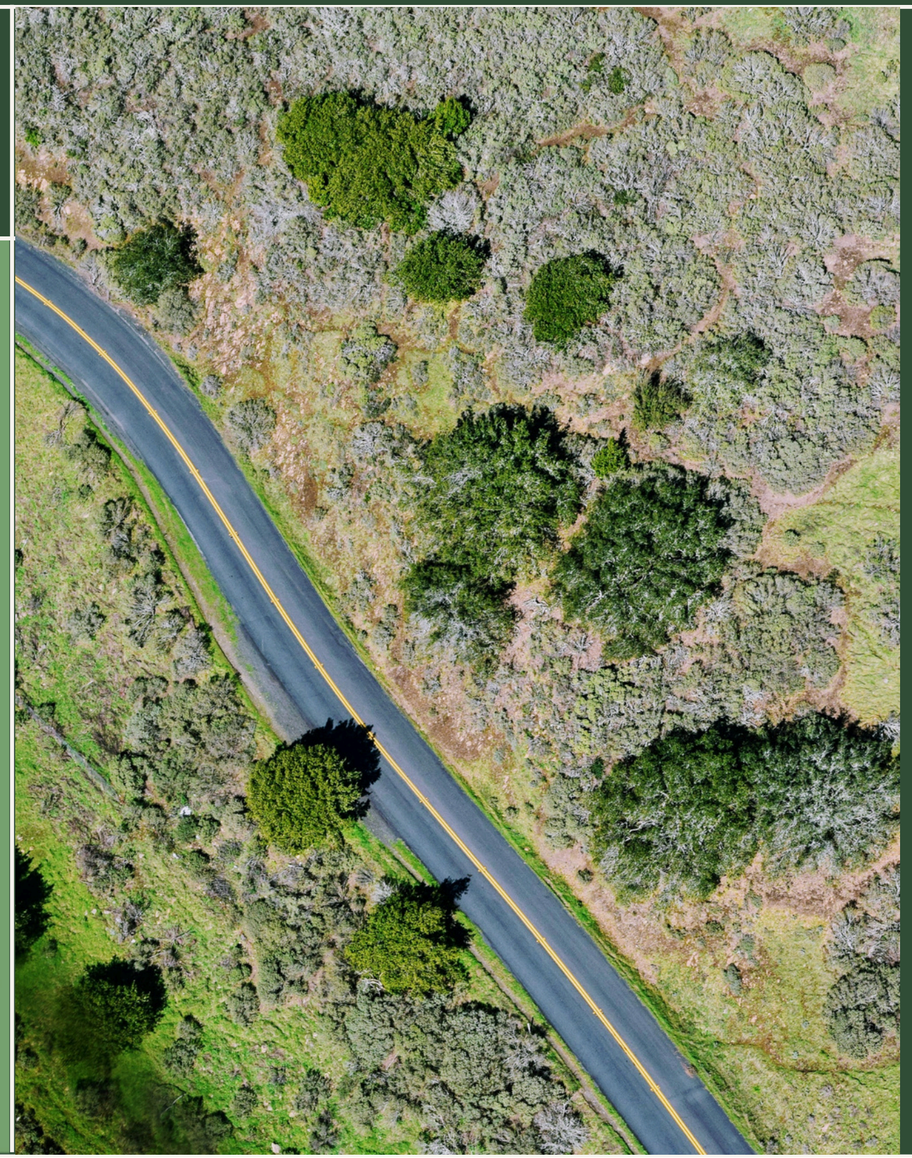
LET'S HAVE A SHORT BREAK!

00:15



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What is GIS?

WE CAN'T STORE THE REAL WORLD, SO WE REPRESENT IT.

FORMAL DEFINITION:

GEOGRAPHIC INFORMATION SYSTEM(S), GIS (NOUN): GIS IS A TECHNOLOGY THAT IS USED TO CREATE, MANAGE, ANALYZE, AND MAP ALL TYPES OF DATA.

- CONNECT DATA TO MAP;
- INTEGRATE LOCATION DATA WITH ALL TYPES OF DESCRIPTIVE INFORMATION;

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Data Models:
Vector x Raster

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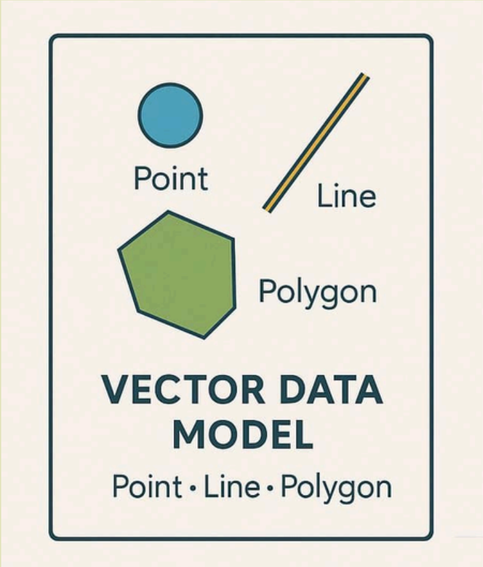
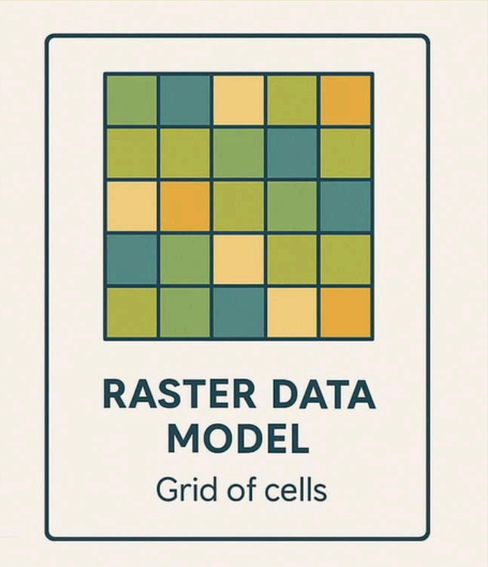
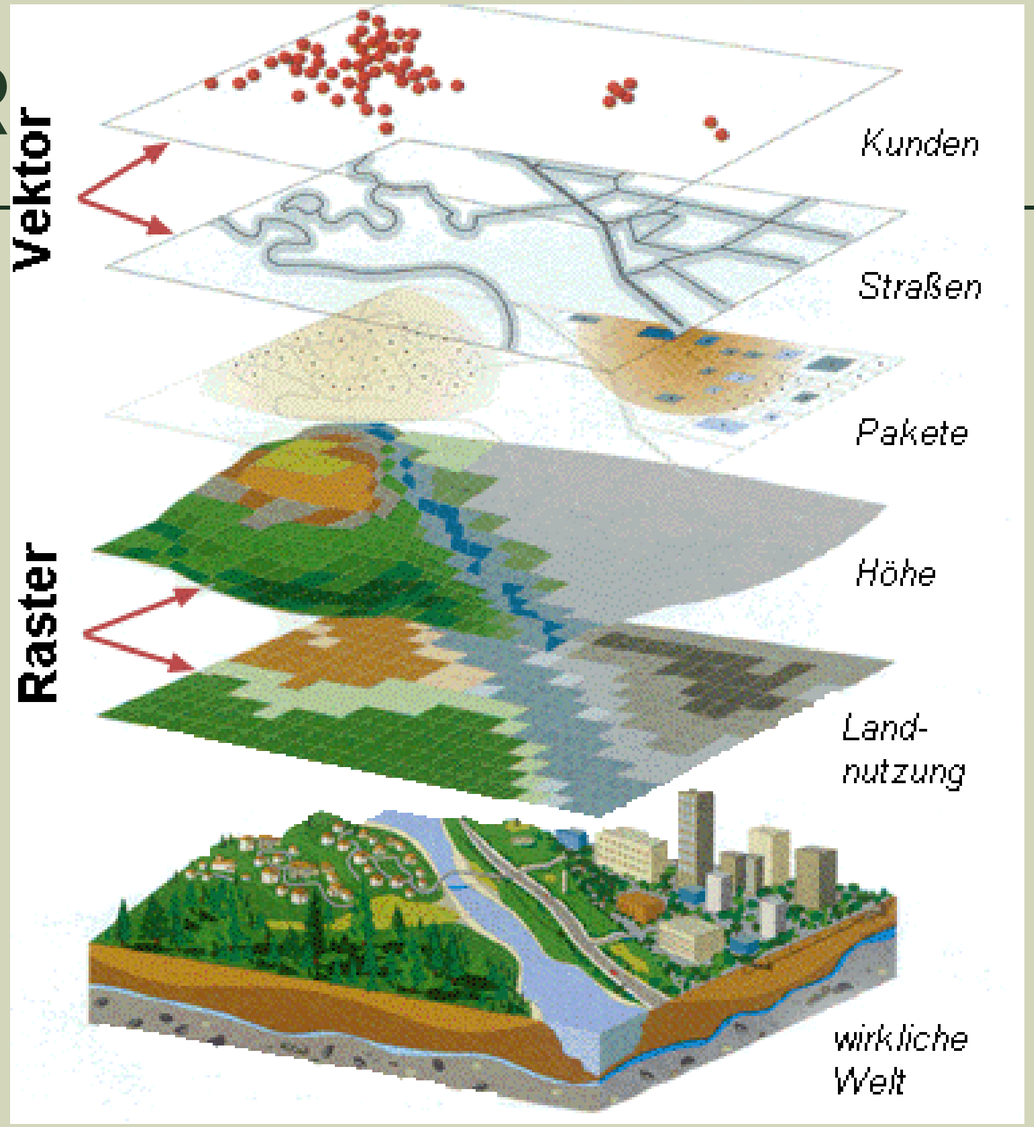
Data Models: Vector x R







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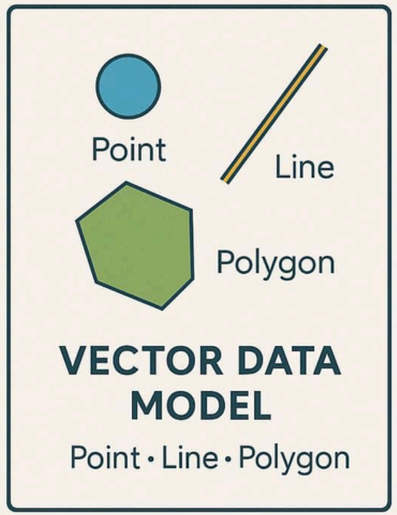

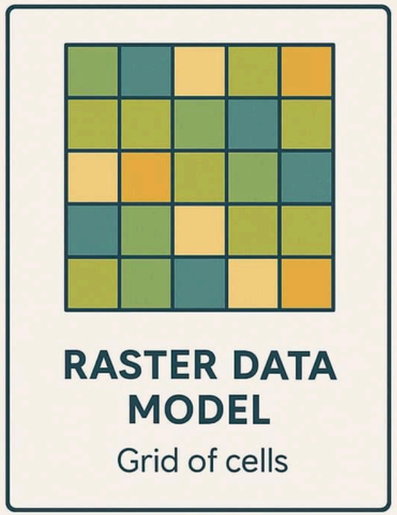

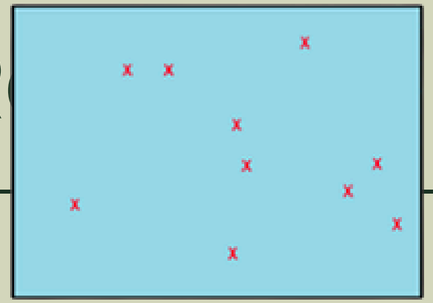
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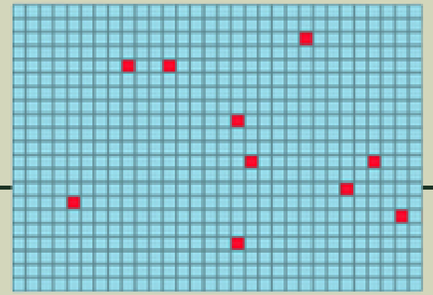
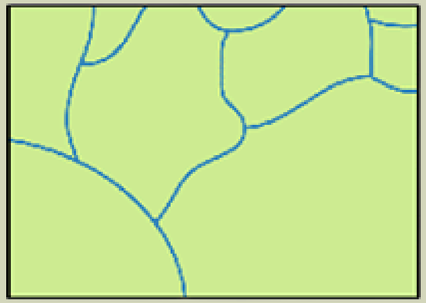
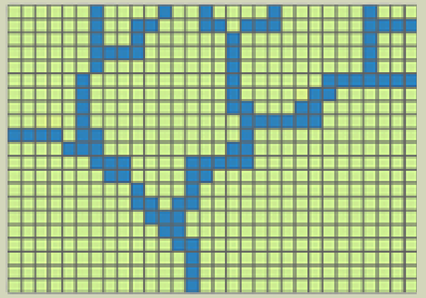
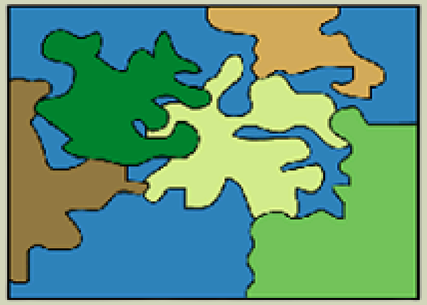
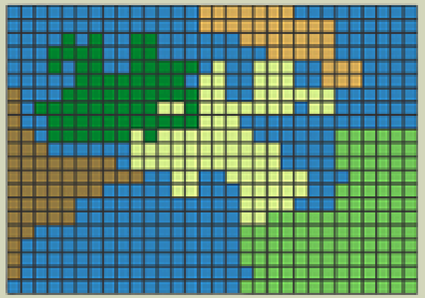

Raster point features


Line features


Raster line feat


Polygon features


Raster polygon features

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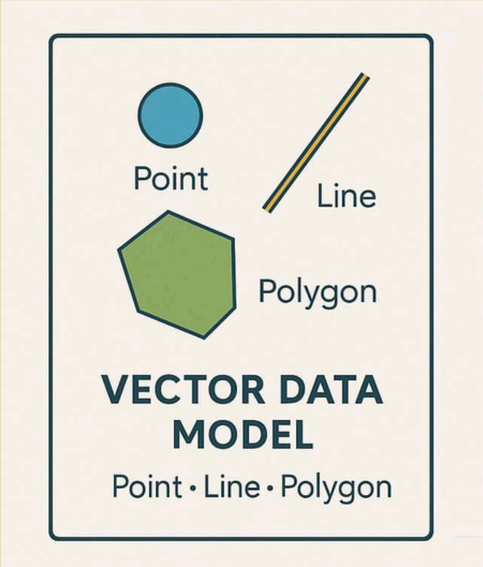

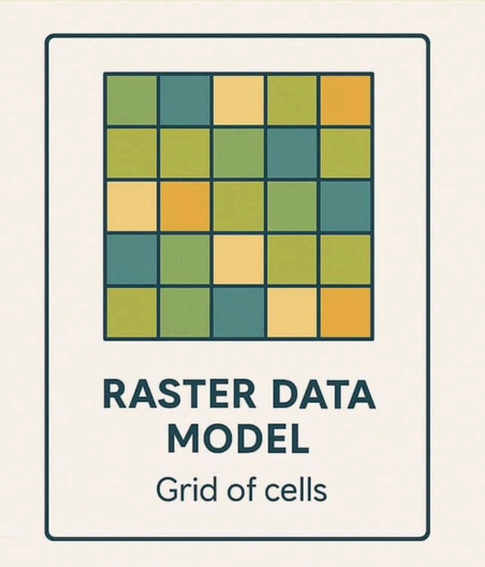

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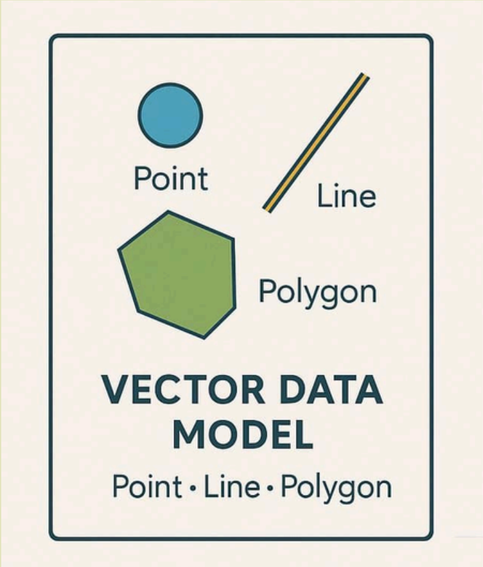

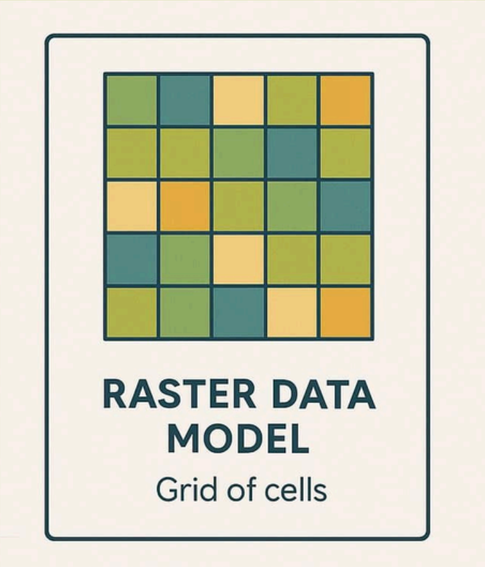

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Thinking Spatially

WHAT IS THE SPACE?

"SPACE IS AN INSEPARABLE SET OF SYSTEMS OF OBJECTS AND SYSTEMS OF ACTIONS."

"IN GEOGRAPHY, SPACE IS BOTH THE STAGE AND THE PRODUCT OF HUMAN RELATIONSHIPS WITH NATURE.
IT IS WHERE TIME MATERIALIZES AND WHERE LIFE UNFOLDS."

MILTON SANTOS, THE NATURE OF SPACE (1996)

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Type of Space	What it means	Example
Physical	Measurable, tangible world	Rivers, roads, land use
Social	Human relationships & power	Inequality, access, demographics
Symbolic	Meanings, memories, identities	Sacred sites, home, belonging

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HOMEWORK #1:

1. **BRING A CONCEPT OF GEOGRAPHICAL SPACE;**

2. TAKE A SHORT WALK AT YOUR FAVORITE PLACE IN THE CITY AND TAKE A PHOTO OF THE LANDSCAPE. THINK OF 3 THINGS THAT COULD BE REPRESENTED IN GIS, ONE AS:

- **A POINT,**
- **A LINE,**
- **A POLYGON.**

- **BE READY TO SHARE YOUR EXAMPLES NEXT CLASS!**

3. INSTALL QGIS IN YOUR LAPTOP (OPTIONAL);

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