Applied geostatistics

How to read the materials

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Topics for this lecture

Each lecture begins with a **list of the topics** that will be covered. They are numbered:

1. First topic
2. Second topic
3. ...

These numbered topics will then start sections of the notes.

A **topic** is a self-contained unit with one theme.

Topic 1: New Topic

This is how a new topic is introduced; note the number which refers back to the list of topics.

The **sub-topics** are listed:

1. First thing about Topic 1
2. Second thing about Topic 1
3. ...

They will be discussed one at a time, immediately following.

Slide

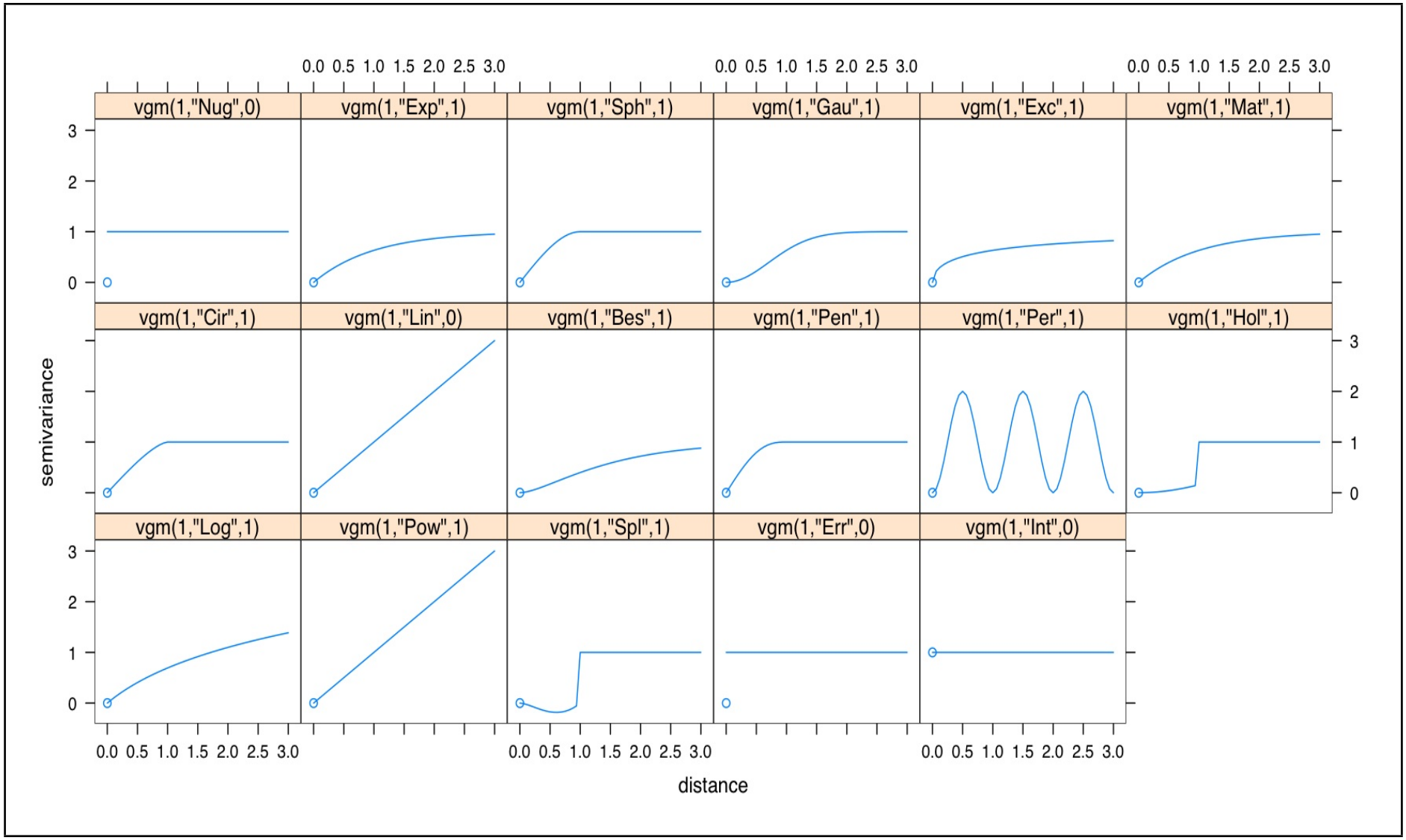
This is a "slide" that contains the **material to be learned**.

- It is usually organized as a list of **bulleted** points
- The **keywords** are highlighted **like this**
- There may be some formulas, for example:

$$\overline{\gamma}(B,B) \approx \frac{1}{|B|^2} \sum_{i=1}^{n} \sum_{j=1}^{n} w_i w_j \gamma(\mathbf{x}_i, \mathbf{x}_j)$$

which are explained in the accompanying text.

Graphics are shown on separate pages



Variogram models available in the `gstat` package

Commentary

These are commentaries that more or less replace what the lecturer would be saying by way of **explanation** or **introduction** when showing a slide. There is no new information here.

These are **conversational** in style, whereas the slides are in **checklist** and **keyword** format.

Computation

Sometimes we want to show commands and results from the R statistical computing environment that we will use for most of our work.

The R code is shown in italics, with the R command prompt > :

```
> data(meuse)
> attach(meuse)
> by(copper, ffreq, summary)
```

The output from R is shown like this:

```
INDICES: 1
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   21.0    27.0    47.0    51.7    74.2   128.0
------------------------------------------------------------
INDICES: 2
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   16.0    22.0    24.0    26.3    30.0    53.0
------------------------------------------------------------
INDICES: 3
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
   14.0    20.0    27.0    27.9    33.0    46.0
```

To check your understanding . . .

After a few slides there will be some "easy" questions; that is, if you understand what just came before, you should be able to answer the questions with a little thought and perhaps some small calculation.

Q1 : *The question will be numbered, like this. It is always a direct question, e.g.:*

What is the capital city of the Netherlands? *Jump to A1* •

After you've answered the question, you can check the answer at the end of the lecture.

You can use the **hyperlink** to jump to the answer.

Answers

At the end of the lecture the numbered questions are repeated, along with their answers. You can use this section as a self-test, to check your understanding.

Recall: the **question** from the lecture was: "What is the capital city of the Netherlands?"

A1 : *Here is the* **answer**, *with some more* **explanation**. *Answers are numbered and refer back to the question with the same number. For example:*

Amsterdam. The seat of government is in The Hague, but formally Amsterdam is the capital city. Return to Q1 •

You can use the **hyperlink** to jump back to the question.

Exercise

At one or more points in each lecture there will be reference to a **computer exercise**. You will take a break from the lecture and complete the exercise before continuing.

These should take from half an hour to four hours to complete; it may take longer to achieve mastery.

The exercises are in another document; here you will be told which document and which sections.

Supplementary information

After the main lecture there is sometimes **extra information** that is either:

- too **specialized** for the lecture, e.g. a detailed mathematical derivation
- for later **reference**, e.g. a bibliography

These are included in the appendix. You are not expected to learn them during this course; they are there for your use later on.