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:

\[
\bar{y}(B, B) \approx \frac{1}{|B|^2} \sum_{i=1}^{n} \sum_{j=1}^{n} w_i w_j y(x_i, x_j)
\]

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:

<table>
<thead>
<tr>
<th>INDICES: 1</th>
<th>Min. 1st Qu. Median Mean 3rd Qu. Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>21.0 27.0 47.0 51.7 74.2 128.0</td>
</tr>
<tr>
<td>INDICES: 2</td>
<td>Min. 1st Qu. Median Mean 3rd Qu. Max.</td>
</tr>
<tr>
<td></td>
<td>16.0 22.0 24.0 26.3 30.0 53.0</td>
</tr>
<tr>
<td>INDICES: 3</td>
<td>Min. 1st Qu. Median Mean 3rd Qu. Max.</td>
</tr>
<tr>
<td></td>
<td>14.0 20.0 27.0 27.9 33.0 46.0</td>
</tr>
</tbody>
</table>
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?

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.