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Warming Up

2.1 Functional Model

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Assessment

Graded Assignment due Feb 8, 2017 17:30 IST



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Exercises: Model formulation

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Definitions and notation

3/3 points (ungraded)

The model of observation equations (or mathematical model) consists of:

- ☐ A functional model
- ☐ A stochastic model
- ☒ The functional and stochastic model ✓
- ☐ A first principles physical model

Which description fits best to 'the functional model'?

- ☐ A model that describes a function

- ▶ 4. Best Linear Unbiased Estimation (BLUE)
- ▶ Pre-knowledge Mathematics
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- ☐ A model that relates deterministic and stochastic variables
- ☐ A model that relates observations to observables
- ☒ A model that relates parameters to observables ✓

The underline under a letter indicates:

- ☐ That this variable is a vector
- ☐ That this variable is deterministic
- ☒ That this variable is stochastic ✓
- ☐ That this variable is a scalar

Answer

Correct: Correct

Explanation

Note: the notation adopted here is not universal, for instance in other textbooks you will find other notation conventions.

Submit

✓ Correct (3/3 points)

Dimensions

4/4 points (ungraded)

What is the dimension of \mathbf{A} ?

☒ $m \times n$ ✓

☐ $n \times 1$

☐ $m \times 1$

☐ 1×1

What is the dimension of \mathbf{y} ?

☐ $m \times n$

☐ $n \times 1$

☒ $m \times 1$ ✓

☐ 1×1

What is the dimension of e ?

☐ $m \times n$

☐ $n \times 1$

☒ $m \times 1$ ✓

☐ 1×1

What is the dimension of Ax ?

☐ $m \times n$

☐ $n \times 1$

☒ $m \times 1$ ✓

☐ 1×1

Submit

✓ Correct (4/4 points)

What's in the vector?

2/2 points (ungraded)

y is the vector with

☐ observables

☐ unknown parameters

☒ observations ✓

e is the vector with

☒ random measurement errors ✓

☐ unknowns

☐ deterministic measurement errors

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✓ Correct (2/2 points)

True or False?

4/4 points (ungraded)

An observable is a realization of an observation.

false ▼

✓ Answer: false

Explanation

The other way around: an OBSERVATION is a realization of an OBSERVABLE.

The vector of unknown parameters is always deterministic

true ▼

✓ Answer: true

Each measurement always has an error

true ▼

✓ Answer: true

Suppose we have a vector of observations $[2.1 \ 1.8 \ 2.0 \ 2.1]^T$. We will indicate this vector as y .

false ▼

✓ Answer: false

Explanation

The observations are given and deterministic, therefore notation y without underlining is used.

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✓ Correct (4/4 points)

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