

Regression Analysis

Analysis of Variance

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Parameter Estimation

Examples



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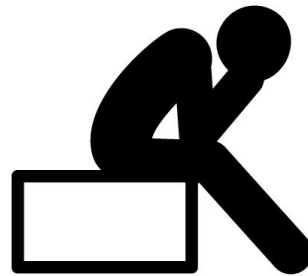
About This Lesson



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Example 1: Global Suicide by Region

What are the estimates for the mean suicide rates for the different regions?



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Parameter Estimation

```
model = aov(suicidesper100k ~ region, data=reg_data)
model.tables(model, type = "means")
```

Overall Mean: 10.276

$\hat{\mu}_{\text{easia}} = 10.29$	$n_{\text{easia}} = 10$
$\hat{\mu}_{\text{wasia}} = 0.58$	$n_{\text{wasia}} = 1$
$\hat{\mu}_{\text{eeurope}} = 17.41$	$n_{\text{eeurope}} = 15$
$\hat{\mu}_{\text{weurope}} = 12.75$	$n_{\text{weurope}} = 3$
$\hat{\mu}_{\text{west}} = 11.68$	$n_{\text{west}} = 18$
$\hat{\mu}_{\text{america}} = 7.86$	$n_{\text{america}} = 26$
$\hat{\mu}_{\text{mideast}} = 2.46$	$n_{\text{mideast}} = 7$

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Example 2: Keyboard Layout

Three different keyboard layouts are being compared in terms of typing speed.

What are the estimates for the mean typing times for the different groups of keyboards?



Layout 1	Layout 2	Layout 3
23.8	30.2	27.0
25.6	29.9	25.4
24.0	29.1	25.6
25.1	28.8	24.2
25.5	29.1	24.8
26.1	28.6	24.0
23.8	28.3	25.5
25.7	28.7	23.9
24.3	27.9	22.6
26.0	30.5	26.0
24.6	*	23.4
27.0	*	*

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Parameter Estimation

```
model = aov(speed ~ layout) model.tables(model, type = "means")
```

Tables of means

Grand mean

26.21212

Layout

	1	2	3
	25.12	29.11	24.76
rep	12.00	10.00	11.00

Overall Mean: 26.21212

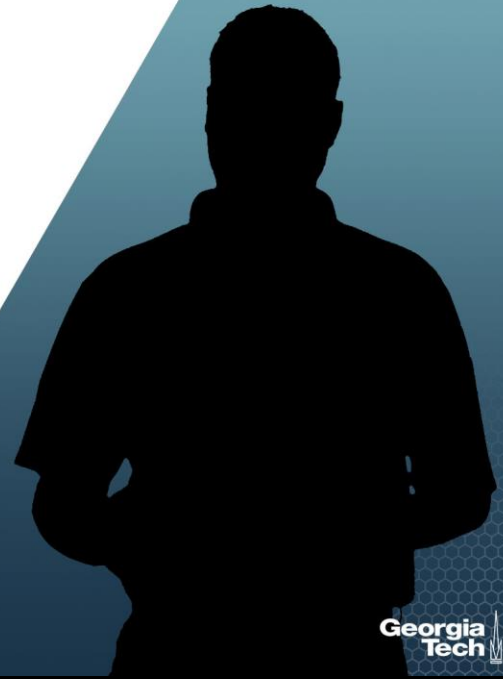
$$\hat{\mu}_{\text{layout1}} = 25.12$$

$$\hat{\mu}_{\text{layout2}} = 29.11$$

$$\hat{\mu}_{\text{layout3}} = 24.76$$

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Summary



Georgia
Tech