

# DATA 609 HW Week 10

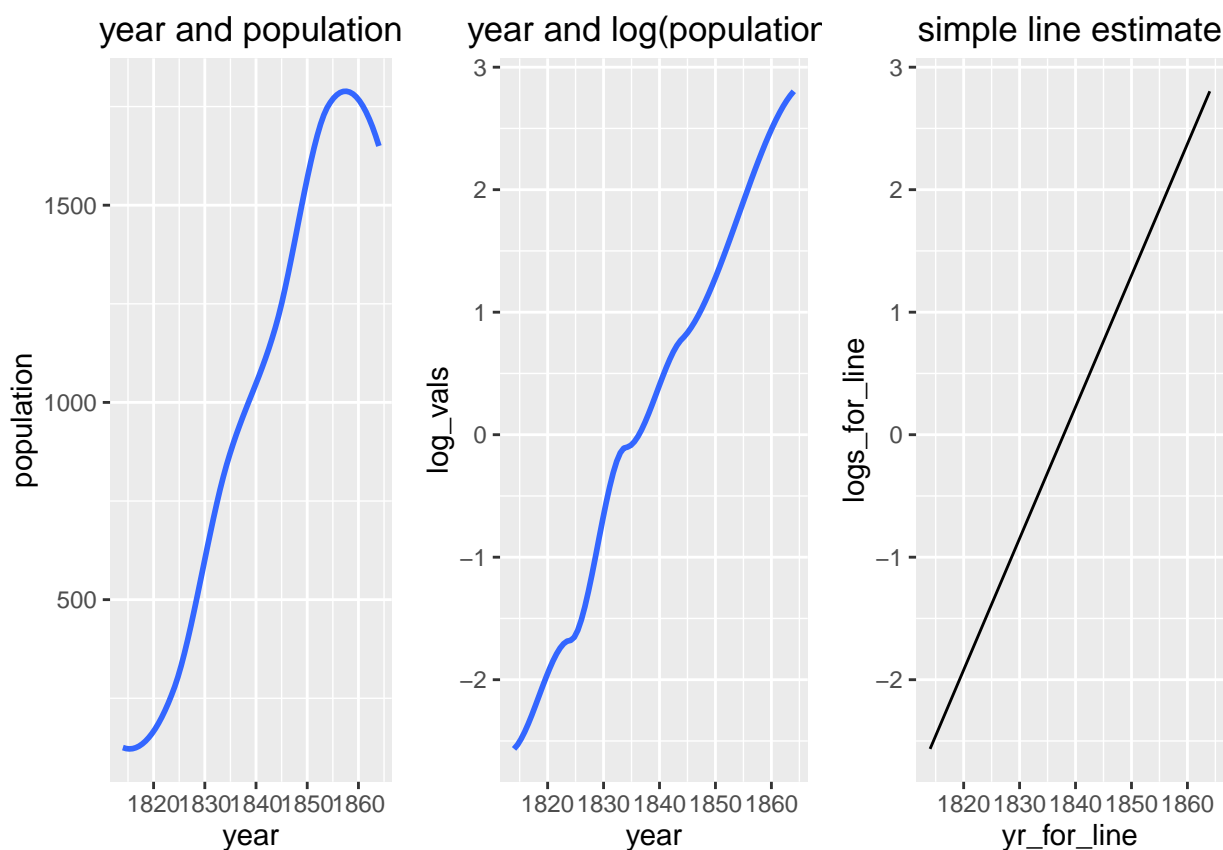
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*11/1/2016*

## Page 469 #3

- By simply looking at this plot, it seems that the M value would occur at about 1860 (when population M is about 1750)
- Try logistic curve:

In this case, a logistic curve does seem reasonable:



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Other phenomena (other than drug dosage) in which the model described in the text might be used:

(ie - find amount and interval, given assimilation rate decay rate)

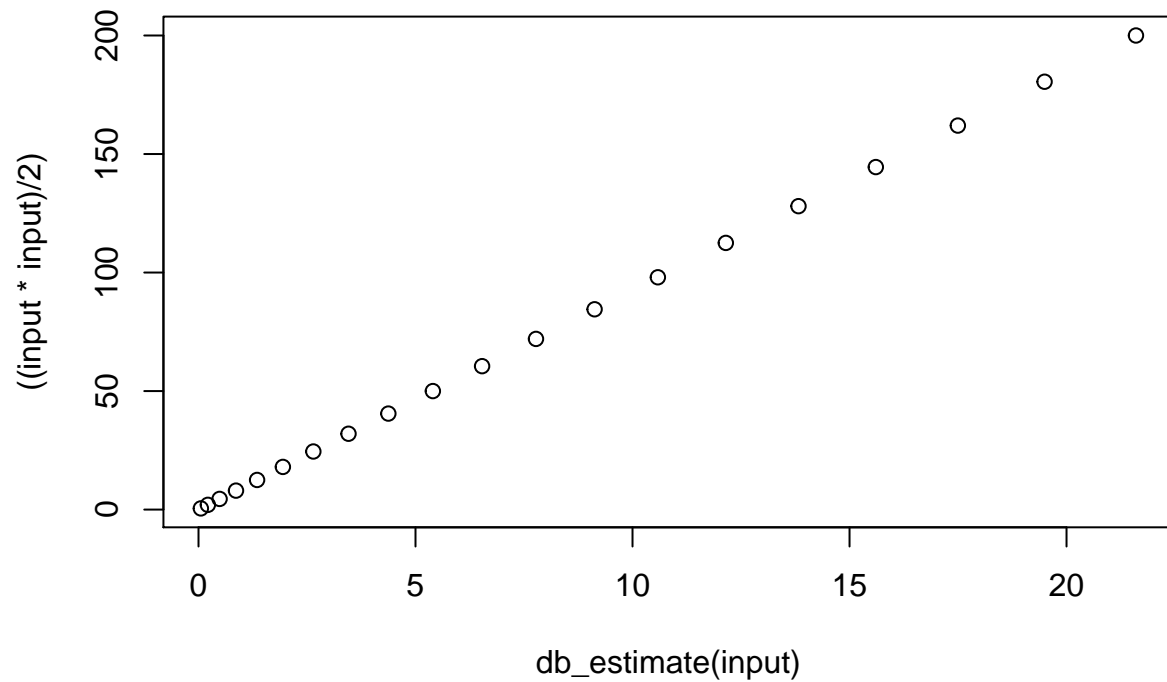
- Consider a large lake with rivers flowing into and out of it, with corresponding rates of pollution and rates of cleansing.
- Consider immigration and emigration into and out of a country (per nationality or ethnicity), given the birth rates and death rates of those corresponding nationalities or ethnicities.
- Consider the body's PH level given input out output of Acidic and Alkaline foods

a) Using the estimate that  $db = 0.054 * v^2$ , show that 11.29's constant  $k = 19.9$

```
## [1] 0.054 0.216 0.486 0.864 1.350 1.944 2.646 3.456 4.374 5.400
## [11] 6.534 7.776 9.126 10.584 12.150 13.824 15.606 17.496 19.494 21.600
```

```
## [1] 0.02512563 0.10050251 0.22613065 0.40201005 0.62814070
## [6] 0.90452261 1.23115578 1.60804020 2.03517588 2.51256281
## [11] 3.04020101 3.61809045 4.24623116 4.92462312 5.65326633
## [16] 6.43216080 7.26130653 8.14070352 9.07035176 10.05025126
```

```
## [1] 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492
## [11] 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492 2.1492
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## [1] 9.259259 9.259259 9.259259 9.259259 9.259259 9.259259 9.259259
## [8] 9.259259 9.259259 9.259259 9.259259 9.259259 9.259259 9.259259
## [15] 9.259259 9.259259 9.259259 9.259259 9.259259 9.259259
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