

MATH 390.4 / 650.2 Spring 2019

Writing Assignment #1

Professor Adam Kapelner

Due 11:59PM Thursday KY604, April 18, 2019

(this document last updated 7:30pm on Sunday 24th March, 2019)

Argue for or against one of the following prompts.

- (a) The laws of physics are absolutely true (or not).
- (b) There exists an all-powerful, all-knowing and timeless being / intelligence (or not).
- (c) Global warming is real (or not).
- (d) The optimal human diet for health is [insert a diet here] (or not).
- (e) People who smoke get lung cancer (or not).

It is your job to *limit*, *scope* and *concretize* the above which are *deliberately open-ended* and nebulous. You will need to formulate a model with phenomenon(s) that can be measured (explain how) and characteristics of the units under consideration. You will need to clearly define what “models” are and discuss their limitations. In the appropriate context, you must write about the concepts we learned / will learn in class, including but not limited to $t, f, g, h^*, \delta, \epsilon, e, t, z_1, \dots, z_t, \mathbb{D}, \mathcal{H}, \mathcal{A}, n, p, x_{\cdot 1}, \dots, x_{\cdot p}, x_1, \dots, x_n, \mathcal{X}, y, \mathcal{Y}$, the fidelity of the measurement process, extrapolation, interpolation, stationarity, overfitting, validation (in-sample vs. out-of-sample), model selection, machine learning, etc.

Specs: Your essay should be at least 10 pages double-spaced with one inch margin, 12pt Times (or Computer Modern if using L^AT_EX) and be appropriately organized. Sectioning is at your preference.