

Instruction for problem set_4

1. Derive first and second moment (i.e. mean and variance) of distributions :

- i. You can start from it's probability density function (PDF), or
- ii. Starting from PDF of some other known distributions.
- iii. Notice that with given degree of freedom, some of the moments may NOT exist.

2. Exercise 3.1 of professor Kuan's lecture :

- i. Derive the estimators of β with the three model specifications,
- ii. For comparison, you can treat the three models as :

$$y_t = \alpha + \beta x_t + e, \quad t = 1, \dots, T$$

$$y_t = (\alpha + \beta \bar{x}) + \beta x_t + e, \quad t = 1, \dots, T$$

$$y_t = 0 + \beta x_t + e, \quad t = 1, \dots, T$$

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