Econometrics I's Homework

Deadline: April 22, 2020, PM23:59:59
(exceptionally two weeks, but usually one week.)

- The answer should be written in English or Japanese.
- Your name and student ID number should be included in your answer sheet.
- Send your answer to the email address: `tanizaki@econ.osaka-u.ac.jp`.
- The subject should be Econome 1 or 1.

☐ Consider the following regression model:

$$y_t = \alpha + \beta X_t + u_t, \qquad t = 1, 2, \cdots, T,$$

where y_t and X_t denote dependent and independent variables, respectively. T is the sample size. u_1, u_2, $\cdots$, u_T are mutually independently distributed with mean zero and variance σ^2. α and β are unknown parameters to be estimated.

(1) Derive the ordinary least squares estimators of α and β, which should be denoted by $\hat{\alpha}$ and $\hat{\beta}$.

(2) Obtain mean and variance of $\hat{\beta}$.

(3) Obtain mean and variance of $\hat{\alpha}$.