# Assignments #11 of
# Econometrics I & Advanced Econometrics I (2013SY)

July 10, 2013

## Instruction to students

1. Dead line for submission: **July 17, 2013**. Please submit your answer at the end of the class.
2. Use A4 size papers to answer.
3. The answer may be written in Japanese as well as English.

## Q

Let $\{Y_t\}$ $(t = 1, \ldots, n)$ be an independent random sequence with

$$\mathrm{E}(Y_t) = \mu, \quad \mathrm{Var}(Y_t) = \sigma_t^2 < \infty.$$

And let be

$$\lim_{n\to\infty} \frac{1}{n} \sum_{t=1}^{n} \sigma_t^2 = c < \infty.$$

Prove

$$\bar{Y}_n \equiv \frac{1}{n} \sum_{t=1}^{n} Y_t \xrightarrow{P} \mu \quad \text{as } n \to \infty,$$

i.e. $\bar{Y}_n/n$ converges in probability to $\mu$ by using inequalities on expectations.