M.-F. Ho **Bayes Note**

Admissibility

How to choose from all these estimators?

1. unbiased

2. but all Bayes estimators are not unbiased

$$X = x_1, ..., x_n$$
$$X^{(i)} \sim \mathrm{N}(\mu, I) \, \text{i.i.d}$$

wish to estimate: μ. The natural estimate (James and Stein `https://en.wikipedia.org/wiki/James%E2%80%93Stein_estimator`):

$$(\hat{\underline{\mu}}) = (1/n \sum x_1^{(i)}, ..., 1/n \sum x_n^{(i)}) \tag{1}$$

where $\hat{\mu}$ is inadmissible. Reference: Efrow and Morris, Jasa, baseball averages.

In Charlie Stein's loss function:

$$\sum_{i=1}^{k} (\hat{\mu}_i - \mu_i)^2$$

where $\hat{\underline{\mu}}$ is inadmissible.

But the professor thinks we should use:

$$\min_i (\hat{\mu}_i - \mu_i)^2.$$

If we have interchangeability, Charlie-Stein works. The professor suggests Charlie-Stein is not sensible if the coordinates are not exchangeable. We should pay attention to the loss functions.