Homework 1

GVPT 729A

9/14/2018

In this homework assignment you will compare estimates of a sample mean using MLE to Least Squares. Below is a likeihood function for the OLS model with no covariates. You can use this function calculate the MLE for the mean (μ).

```
my.ols <- function(mu, y) {-sum((y - mu)^2)}

ols.mle <- function(y) {
  est <- optim(par = 0, fn = my.ols, y = y,
               control = list(fnscale = -1),
               method = "Brent",  # for 1d problems
               lower = -100, upper = 100)
  res <- list(est = est$par)
  return(res)
}
```

You should write a Monte Carol simulation and compare your estimates of $\hat{\mu}$ and $se(\hat{\mu})$ for the MLE and the Least Squares calculation (for the Least Squares calculation you can use lm(y~)). Your results will be sensitive to the sample size and number of replications you use in your Monte Carlo experiment. Please comment on this.