```
**************************************************************************
> **
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* Practicalities of Running RCTs - Assignment 2
* Zachary Kuloszewski and Jun Wong
*
* Due Nov 17, 2022
*
**************************************************************************
> **

** set options **
version 16
set type double
capture restore
capture log close
macro drop all

clear all
cls
set more off

// set graphics off
set scheme plotplainblind

local name zach
if "`name'"=="zach" {
        global main "/Users/zachkuloszewski/Dropbox/My Mac (Zachs-MBP.lan)/Doc
> uments"
        global main $main/GitHub/phd_psets/year2/development/ps3
}
if "`name'"=="jun" {
        global main "/Users/junwong/Dropbox/Second Year/Glennerster - RCT/Assi
> gnments"
}

********************** Problem 1.1 - Data Simulation ***********************
> **

local N = 200

set seed     20221115
set sortseed 20221115
```

```
program reg_sim, eclass
        args n_obs clust_flag
        drop _all

        local n_obs 200
        local clust_flag 1
        set obs `n_obs'
        gen id = _n
        gen alpha = 70
        gen beta  = 2.5
        gen eps   = rnormal(0,10)

        *randomization
        gen rand = runiform()
        gsort rand
        gen   rand_id = _n

        if `clust_flag'==0 {
                gen treat = (rand_id > 0.5*_N)
        }
        else if `clust_flag' == 1 {
                egen cohort = cut(rand_id), group(4)
                drop rand rand_id
                gen rand = .
                bys cohort: replace rand = cond(_n==1, runiform(), rand[1])
                gsort rand
                gen rand_id = _n
                gen treat = (_n <= _N / 2)
        }

        gen yi = alpha + beta*treat + eps

        label var treat "Treatment"
        label var yi "Test Score"

        eststo clear

        if `clust_flag' == 0 {
                eststo: reg yi treat
        }
        else if `clust_flag' == 1 {
                eststo: reg yi treat , vce(cluster cohort)
        }
end
```

********************** Problem 1.2 – Data Simulation ***********************
> **

```
eststo clear

simulate _b _se, reps(1): reg_sim `N' 0

esttab using "$main/output/q1_2.tex", replace nonum se lab ///
        star(* 0.10 ** 0.05 *** 0.01)

*********************** Problem 1.3 - More Simulation ***********************
> **

clear
simulate _b _se, reps(100): reg_sim `N' 0

gen tstat  = _b_treat / _se_treat
gen reject = ((tstat >= 1.96) | (tstat <= -1.96))
sum reject

*********************** Problem 1.4 - Varying Sample Size ********************
> **
tempname memhold
tempfile results

postfile `memhold' sample_size reject_rate using `results', replace

forval i=50(50)600 {

        clear
        simulate _b _se, reps(100): reg_sim `i' 0

        gen tstat  = _b_treat / _se_treat
        gen reject = ((tstat >= 1.96) | (tstat <= -1.96))

        qui sum reject
        post `memhold' (`i') (`r(mean)')

}
postclose `memhold'
use `results', clear

twoway line reject_rate sample_size, ytitle("Power (Rejection Rate)") ///
        xtitle("Sample Size") yline(0.8)

graph export "$main/output/q1_4.png", replace
```

```
*********************** Problem 1.5 - Clustering ***************************
> **
clear
simulate _b _se, reps(100): reg_sim `N' 1
gen tstat  = _b_treat / _se_treat

tempname memhold
tempfile results
postfile `memhold' pval using `results', replace

levelsof tstat, local(ts)
foreach t of local ts {
        local pval = 2 * ttail(3, `t')
        post `memhold' (`pval')
}
postclose `memhold'
use `results', clear
gen reject = (pval <= 0.05)
sum reject
```