
```
name: <unnamed>
log: /Users/erinmarkiewitz/Dropbox/Phd_Coursework/Econ675/hw2\results\
> pset2_stata.smcl
log type: smcl
opened on: 11 Oct 2018, 14:37:58
```

```
1 .
2 .
3 . *****
4 . *** Problem 1
5 . *****
6 . /*
> set obs 10000
> timer on 1
> program IMSEsim, rclass
> drop _all
> set obs 1000
> gen x = rnormal(-1/4, 5/8)
> gen fx = normalden(-1/4, 5/8)
> _kdens x, at(x) generate(fxh) bw(.5) kernel(epan2)
> gen diffLI = (fx - fxh)^2
> gen diffL0 = 0
>
>
> forvalues i = 1/1000 {
>     _kdens x if _n != `i', at(x) generate(fxh`i') bw(.5) kernel(epan2)
>     replace diffL0 = (fx - fxh`i')^2 if _n == `i'
> }
>
> qui summ diffLI
> return scalar data1 = r(mean)
> qui summ diffL0
> return scalar data2 = r(mean)
> end
>
>
>
> simulate IMSE_LI=r(data1) IMSE_L0 = r(data2), reps(1) nodots: IMSEsim
> timer off 1
> timer list
> */
```


(1,000 missing values generated)
(1,000 missing values generated)

21 .

22 .

23 . mata:

```
      mata (type end to exit)
: void polyloop(i) {
> real matrix v_hat
> real matrix theta_hat
>
> X      = uniform(`n',`d'):*2 :-1
> ep     = invnormal(uniform(`n',1))*0.3637899*(1 :+ rowsum(X:^2))
> gx     = exp(rowsum(X:^2))
> T      = invnormal(uniform(`n',1)) + rowsum(X:^2):^.5 :>= 0
> Y      = T + gx + ep
>
>
> A = asarray_create("real",1)
> cons= J(500,1,1)
> X2     = X:^2
> X3     = X:^3
> X4     = X:^4
> X5     = X:^5
> X6     = X:^6
> X7     = X:^7
> X8     = X:^8
> X9     = X:^9
> X10    = X:^10
>
> X1k    = X#X
> X2k    = X2#X2
> X3k    = X3#X3
> X4k    = X4#X4
>
> X1k    = X1k[1::`n',2::5], X1k[1::`n', 8::10], X1k[1::`n',14::15], X1k[1::`n',
> 20]
> X2k    = X2k[1::`n',2::5], X2k[1::`n', 8::10], X2k[1::`n',14::15], X2k[1::`n',
> 20]
> X3k    = X3k[1::`n',2::5], X3k[1::`n', 8::10], X3k[1::`n',14::15], X3k[1::`n',
> 20]
> X4k    = X4k[1::`n',2::5], X4k[1::`n', 8::10], X4k[1::`n',14::15], X4k[1::`n',
> 20]
>
>
> asarray(A,1,X)
> asarray(A,2,(asarray(A,1),X2))
> asarray(A,3,(asarray(A,2),X1k))
> asarray(A,4,(asarray(A,3),X3))
```

```

> asarray(A,5,(asarray(A,4),X2k))
> asarray(A,6,(asarray(A,5),X4))
> asarray(A,7,(asarray(A,6),X3k))
> asarray(A,8,(asarray(A,7),X5))
> asarray(A,9,(asarray(A,8),X4k))
> asarray(A,10,(asarray(A,9),X6))
> asarray(A,11,(asarray(A,10),X7))
> asarray(A,12,(asarray(A,11),X8))
> asarray(A,13,(asarray(A,12),X9))
> asarray(A,14,(asarray(A,13),X10))
>
>
> theta_hat = I(1,14):*0
> v_hat = I(1,14):*0
> k_hat = I(1,14):*0
>
> for (j=1; j<=14; j++) {
>
> Z = qrsolve(cons,(T,asarray(A,j)))
> ZZ = Z*Z'
> Yhat = ZZ*Y
> W = diag(ZZ)
> ZQ = (cons,asarray(A,j))*invsym((cons,asarray(A,j))'*(cons,asarray(A,j)))*(c
> ons,asarray(A,j))'
> M = I(`n') - ZQ
> YM = M*Y
> TM = M*T
> theta_hat[1,j] = (TM'*YM) / (TM'*TM)
> sigma = diag(ZQ*(Y-T*theta_hat[1,j]))
> v_hat[1,j] = invsym(T'*ZQ*T)*(T'*ZQ*sigma*ZQ*T)*invsym(T'*ZQ*T)
> st_store(i, "v_hat"+strofreal(j), v_hat[1,j])
> st_store(i, "theta_hat"+strofreal(j), theta_hat[1,j])
> }
>
> }
note: variable k_hat set but not used
note: variable Yhat set but not used
note: variable W set but not used

: end

```

```

24 .
25 .
26 . forvalues i = 1/10 {
    2. mata polyloop(`i')
    3. }

27 . save output_q3.dta, replace
    file output_q3.dta saved

28 .
29 .
30 .
31 . use output_q3,clear

32 . gen obs = _n

33 . reshape long v_hat theta_hat, i(obs) j(k)
    (note: j = 1 2 3 4 5 6 7 8 9 10 11 12 13 14)

Data                                wide    ->    long
-----
Number of obs.                      1000    ->    14000
Number of variables                   29      ->      4
j variable (14 values)               ->      k
xij variables:
      v_hat1 v_hat2 ... v_hat14    ->    v_hat
    theta_hat1 theta_hat2 ... theta_hat14 ->    theta_hat

34 . collapse (mean) mean_v_hat= v_hat  mean_theta_hat=theta_hat (sd) sd_theta_hat
    > t = theta_hat, by(k)

35 . gen mean_bias = mean_theta_hat - 1

36 . gen v_theta_hat = sd_theta_hat^2

37 .
38 . log close
    name:  <unnamed>
    log:   /Users/erinmarkiewitz/Dropbox/Phd_Coursework/Econ675/hw2/results\
> pset2_stata.smcl
    log type:  smcl
    closed on:  11 Oct 2018, 14:38:04

```