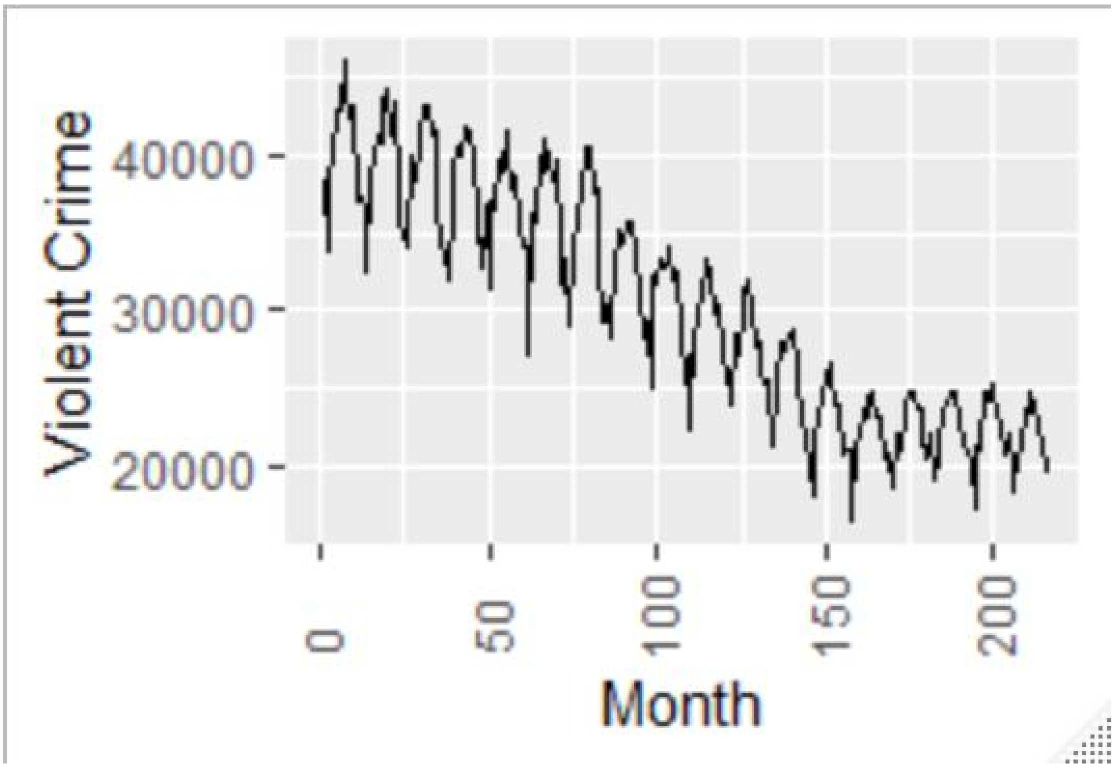
Justin Jia



Exercise 2

From the plot above, I find that the amount of violent crime decreases in the past few years and seasonal effect needs to be considered in regression.

Exercise 3 and 4

the coefficients are not significant when fixed effects are controlled

```
> coeftest(e3, vcov = sandwich)

t test of coefficients:

          Estimate Std. Error  t value  Pr(>|t|)    
tenure  4.0230e-05 8.2515e-06   4.8755 1.086e-06 ***
ptcrim  8.4779e-01 1.2461e-01   6.8037 1.020e-11 ***
p50_inc 2.8306e-07 9.5236e-08   2.9722  0.002956 ** 
share_b 4.7610e-01 3.4219e-03 139.1337 < 2.2e-16 ***
share_h 5.0112e-01 3.7179e-03 134.7853 < 2.2e-16 ***
share_w 5.3838e-01 9.8017e-03  54.9268 < 2.2e-16 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

> printCoefmat(coeftest(e4, vcov = sandwich)[1:6,])
           Estimate  Std. Error t value Pr(>|t|)
tenure  -3.7707e-06  8.5072e-06 -0.4432   0.6576
ptcrim  -5.5426e-01  3.7947e-01 -1.4606   0.1441
p50_inc -4.7987e-08  6.4751e-07 -0.0741   0.9409
share_b -7.3502e-02  1.0369e-01 -0.7089   0.4784
share_h -1.3236e-01  2.0131e-01 -0.6575   0.5109
share_w -1.6352e-01  1.8332e-01 -0.8920   0.3724
```

Exercise 5

Results for between estimator, within estimator, and first difference estimator

```
> printCoefmat(coeftest(bet, vcov = sandwich)[1:7,])
               Estimate  Std. Error t value  Pr(>|t|)    
(Intercept)  6.4660e-01  3.7387e-02 17.2947 < 2.2e-16 ***
tm          -6.2395e-06  1.4201e-06 -4.3938 1.114e-05 ***
cm           1.3376e-01  8.4755e-02  1.5782 0.1145314    
im           3.6503e-07  1.9239e-07  1.8974 0.0577797 .  
bm          -1.1838e-01  3.8686e-02 -3.0599 0.0022142 ** 
hm          -2.8080e-01  7.6635e-02 -3.6642 0.0002482 ***
wm          -2.5266e-01  6.7445e-02 -3.7461 0.0001796 ***
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

```
> printCoefmat(coeftest(wit, vcov = sandwich)[1:7,])
               Estimate  Std. Error t value Pr(>|t|)
(Intercept) -2.4527e-17  3.2801e-03  0.0000   1.0000
td          -6.4853e-06  3.1865e-05 -0.2035   0.8387
cd          -1.8626e-01  3.2497e-01 -0.5732   0.5665
id          -7.2632e-07  8.2281e-07 -0.8827   0.3774
bd          -9.3311e-02  1.1997e-01 -0.7778   0.4367
hd          -7.7177e-02  2.2911e-01 -0.3369   0.7362
wd          -7.7287e-02  2.1144e-01 -0.3655   0.7147
```

```
> printCoefmat(coeftest(wit, vcov = sandwich)[1:7,])
               Estimate  Std. Error t value Pr(>|t|)
(Intercept) -2.4527e-17  3.2801e-03  0.0000   1.0000
td          -6.4853e-06  3.1865e-05 -0.2035   0.8387
cd          -1.8626e-01  3.2497e-01 -0.5732   0.5665
id          -7.2632e-07  8.2281e-07 -0.8827   0.3774
bd          -9.3311e-02  1.1997e-01 -0.7778   0.4367
hd          -7.7177e-02  2.2911e-01 -0.3369   0.7362
wd          -7.7287e-02  2.1144e-01 -0.3655   0.7147
```

cannot get result from GMM because of inefficient iteration.