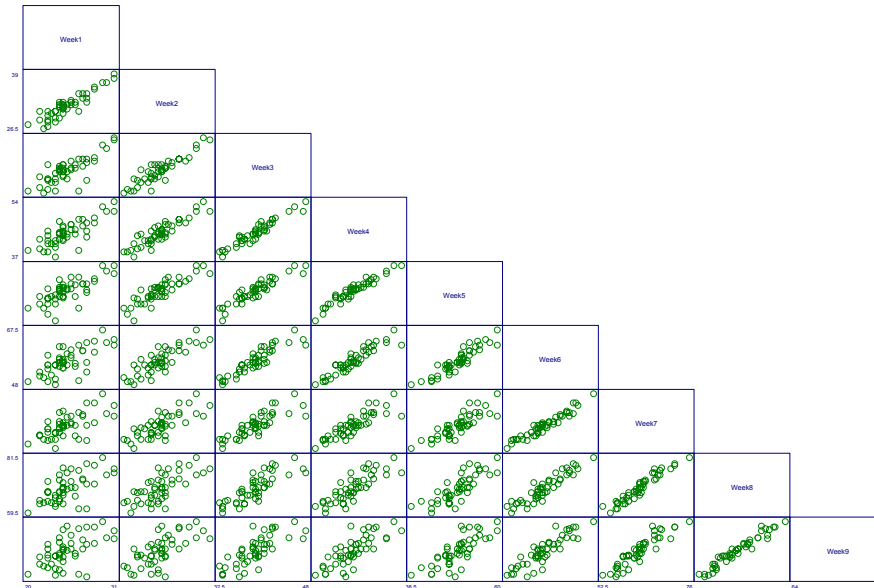


Lab_LDA_Pigs

Scatter plot matrix

graph Week1 Week2 Week3 Week4 Week5 Week6 Week7 Week8 Week9, matrix half



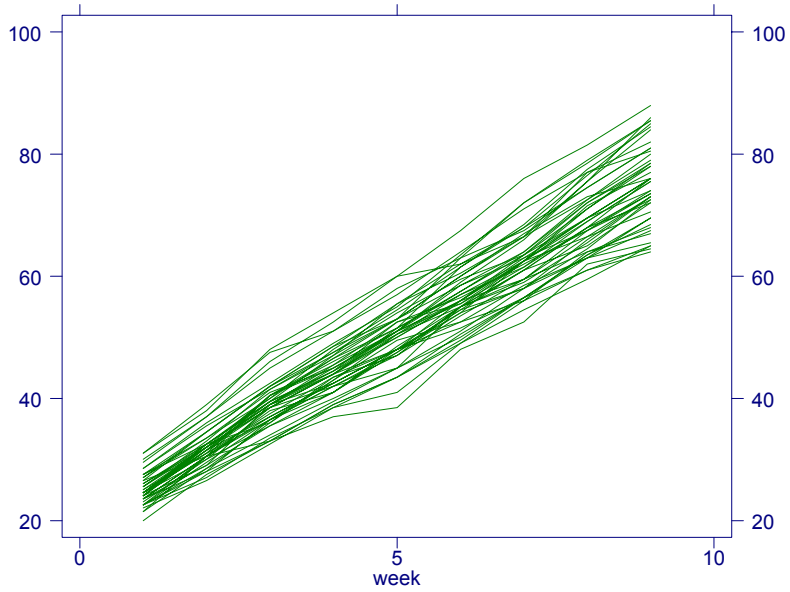
To calculate correlations

```
. corr Week1 Week2 Week3 Week4 Week5 Week6 Week7 Week8 Week9  
(obs=48)
```

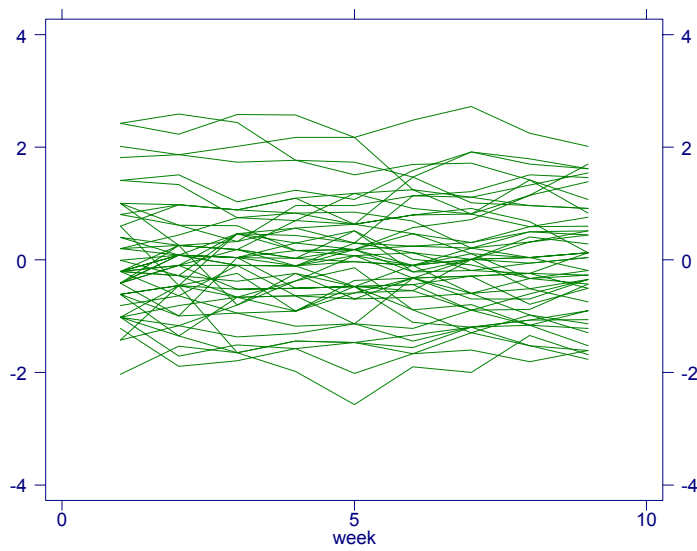
	Week1	Week2	Week3	Week4	Week5	Week6	Week7	Week8	Week9
Week1	1.0000								
Week2	0.9156	1.0000							
Week3	0.8015	0.9118	1.0000						
Week4	0.7958	0.9084	0.9582	1.0000					
Week5	0.7494	0.8809	0.9280	0.9621	1.0000				
Week6	0.7051	0.8353	0.9058	0.9327	0.9219	1.0000			
Week7	0.6551	0.7759	0.8435	0.8681	0.8546	0.9633	1.0000		
Week8	0.6255	0.7133	0.8167	0.8293	0.8104	0.9280	0.9586	1.0000	
Week9	0.5581	0.6638	0.7689	0.7856	0.7856	0.8893	0.9170	0.9170	1.0000

```
. sort ID week
```

```
. graph Weight week, c(L) s(i) xlab ylab rlab
```



To view tracking



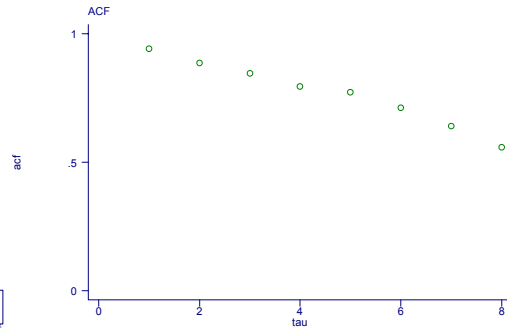
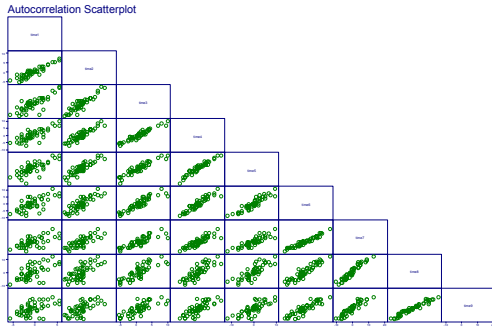
. autocor Weight week ID

	time1	time2	time3	time4	time5	time6	time7
time1	1.0000						
time2	0.9156	1.0000					
time3	0.8015	0.9118	1.0000				
time4	0.7958	0.9084	0.9582	1.0000			
time5	0.7494	0.8809	0.9280	0.9621	1.0000		
time6	0.7051	0.8353	0.9058	0.9327	0.9219	1.0000	
time7	0.6551	0.7759	0.8435	0.8681	0.8546	0.9633	1.0000
time8	0.6255	0.7133	0.8167	0.8293	0.8104	0.9280	0.9586
time9	0.5581	0.6638	0.7689	0.7856	0.7856	0.8893	0.9170
		time8	time9				
time8		1.0000					
time9		0.9695	1.0000				

```

          acf
1.  .9425781
2.  .8870165
3.  .8462396
4.  .7962576
5.  .7724156
6.  .7121489
7.  .6407955
8.  .5581002
(note: file acf.gph not found)

```



```

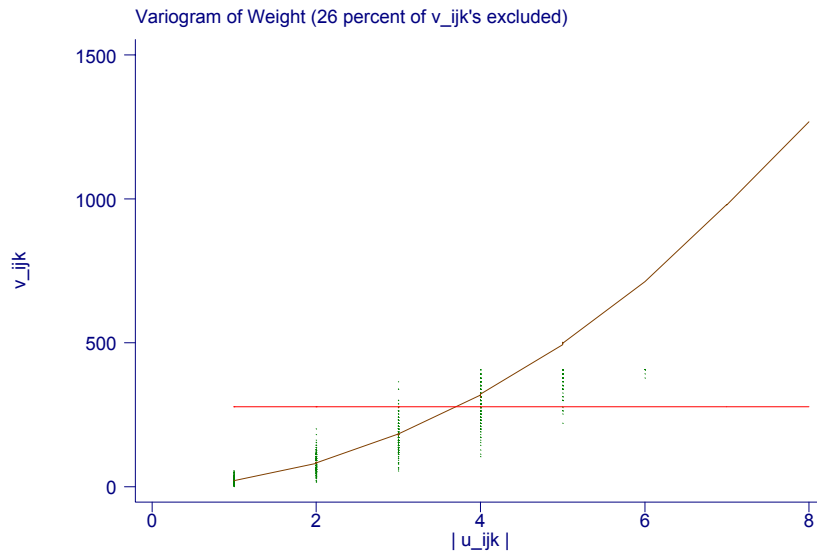
. tsset ID week
      panel variable: ID, 1 to 48
      time variable: week, 1 to 9

. iis
i() is ID

. tis
t() is week

. variogram Weight, bw(.8)
Computing smooth lowess model for v in ulag
(note: file vgram.gph not found)

```



First lets fit simple regressions

```
. regress Weight week
```

Source	SS	df	MS	Number of obs =	432
Model	111060.882	1	111060.882	F(1, 430) =	5757.41
Residual	8294.72677	430	19.2900622	Prob > F =	0.0000
				R-squared =	0.9305
				Adj R-squared =	0.9303
Total	119355.609	431	276.927167	Root MSE =	4.392

Weight	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
week	6.209896	.0818409	75.88	0.000	6.049038 6.370754
_cons	19.35561	.4605447	42.03	0.000	18.45041 20.26081

```
. xtgee Weight week, corr(ind)
```

Iteration 1: tolerance = 1.971e-15

```
GEE population-averaged model
Group variable:          ID
Link:                   identity
Family:                 Gaussian
Correlation:            independent
Scale parameter:        19.20076
Wald chi2(1)            = 5784.19
Prob > chi2             = 0.0000
Pearson chi2(432):      8294.73
Deviance                = 8294.73
Dispersion (Pearson):   19.20076
Dispersion              = 19.20076
```

Weight	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
week	6.209896	.0816513	76.05	0.000	6.049862 6.369929
_cons	19.35561	.4594773	42.13	0.000	18.45505 20.25617

Now let's specify the correlation structure

1. Exponential

```
. xtgee Weight week, i(ID) corr(ar1) t(week)
```

Iteration 1: tolerance = .02513276

Iteration 2: tolerance = .00009237
 Iteration 3: tolerance = 4.366e-07

```
GEE population-averaged model
Group and time vars:      ID week
Link:                     identity
Family:                   Gaussian
Correlation:              AR(1)
Scale parameter:         19.26754
Number of obs             = 432
Number of groups         = 48
Obs per group: min      = 9
                      avg = 9.0
                      max = 9
Wald chi2(1)            = 6254.91
Prob > chi2              = 0.0000
```

Weight	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
week	6.272089	.0793052	79.09	0.000	6.116654 6.427524
_cons	18.84218	.6745715	27.93	0.000	17.52004 20.16431

. xtcorr

Estimated within-ID correlation matrix R:

	c1	c2	c3	c4	c5	c6	c7	c8	c9
r1	1.0000								
r2	0.9167	1.0000							
r3	0.8403	0.9167	1.0000						
r4	0.7702	0.8403	0.9167	1.0000					
r5	0.7061	0.7702	0.8403	0.9167	1.0000				
r6	0.6472	0.7061	0.7702	0.8403	0.9167	1.0000			
r7	0.5933	0.6472	0.7061	0.7702	0.8403	0.9167	1.0000		
r8	0.5438	0.5933	0.6472	0.7061	0.7702	0.8403	0.9167	1.0000	
r9	0.4985	0.5438	0.5933	0.6472	0.7061	0.7702	0.8403	0.9167	1.0000

2. Uniform

. xtgee Weight week, corr(exc)

Iteration 1: tolerance = 5.585e-15

```
GEE population-averaged model
Group variable:          ID
Link:                   identity
Family:                 Gaussian
Correlation:            exchangeable
Scale parameter:       19.20076
Number of obs          = 432
Number of groups       = 48
Obs per group: min    = 9
                    avg = 9.0
                    max = 9
Wald chi2(1)          = 25337.48
Prob > chi2            = 0.0000
```

Weight	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
week	6.209896	.0390124	159.18	0.000	6.133433 6.286359
_cons	19.35561	.5974055	32.40	0.000	18.18472 20.52651

. xtreg Weight week, i(ID) re

```
Random-effects GLS regression
Group variable (i) : ID
Number of obs      = 432
Number of groups   = 48
R-sq:  within     = 0.9851
      between     = 0.0000
      overall     = 0.9305
Obs per group: min = 9
              avg  = 9.0
              max  = 9
```

```
Random effects u_i ~ Gaussian
corr(u_i, X)      = 0 (assumed)
Wald chi2(1)     = 25271.50
Prob > chi2      = 0.0000
```

Weight	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
week	6.209896	.0390633	158.97	0.000	6.133333 6.286458
_cons	19.35561	.603139	32.09	0.000	18.17348 20.53774
sigma_u	3.8912528				
sigma_e	2.0963561				

rho | .77505203 (fraction of variance due to u_i)

Note: Uniform correlation and random effects model give same estimates of the parameters.