

In analyzing SoulPulse data, there are different ways to measure the timing of the data. Here is Stata code for creating different time measures for two different variables. At the end is a simple xtmixed equation that shows a common way to analyze these data

* Start with macros defining two variables to be analyzed. This is the only place these variable need to be named

```
local var_a i_dses
local var_b love
local k `var_a' `var_b'
```

* Defining the structure of the data

```
xtset user_id sur_num
```

* Last Observed for all possible values

```
gen lo_`var_a' = .
forvalues i = 1/28 {
replace lo_`var_a' = l`i'.`var_a' if lo_`var_a' == .
}
label var lo_`var_a' "Last Observed instance of `var_a'"
```

```
gen lo_`var_b' = .
forvalues i = 1/28 {
replace lo_`var_b' = l`i'.`var_b' if lo_`var_b' == .
}
label var lo_`var_b' "Last Observed instance of `var_b'"
```

* Days Since Last observation

```
gen dsl_`var_a' = .
forvalues i = 1/28 {
replace dsl_`var_a' = (datesent_ut - l`i'.datesent_ut) if dsl_`var_a' == . & l`i'.`var_a' != .
}
lab var dsl_`var_a' "Days Since Last observation of `var_a'"
```

```
gen dsl_`var_b' = .
forvalues i = 1/28 {
replace dsl_`var_b' = (datesent_ut - l`i'.datesent_ut) if dsl_`var_b' == . & l`i'.`var_b' != .
}
lab var dsl_`var_b' "Days since last observation of `var_b'"
```

* Most Recent prior observation is today

```
foreach j of varlist `var_a' `var_b' {
gen mrd0_`j' = .
replace mrd0_`j' = l1.`j' if datesent_ut == l1.datesent_ut
label var mrd0_`j' "Most recent observation, earlier that day, of `j'"
}
```

* Most Recent prior observation is today

```

foreach j of varlist `k' {
gen   mrd0x_`j' = .
replace mrd0x_`j' = l1.`j' if datesent_ut == l1.datesent_ut
label var mrd0x_`j' "Most recent observation, earlier that day, of `j'"
}

* Most Recent prior observation is today or yesterday
* Better than l1., in case there's a day skip
foreach j of varlist `k' {
gen   mrd01_`j' = .
replace mrd01_`j' = l1.`j' if (datesent_ut == l1.datesent_ut) | (datesent_ut - l1.datesent_ut) == 1
label var mrd01_`j' "Most recent observation, earlier that day or day before, of `j'"
}

* Most Recent prior observation is yesterday
foreach j of varlist `k' {
gen   mrd1_`j' = .
replace mrd1_`j' = l1.`j' if datesent_ut - l1.datesent_ut == 1
label var mrd1_`j' "Most recent observation, day before, of `j'"
}

* Summary of variables created
foreach j of varlist `k' {
sum `j' lo_`j' dsl_`j' mrd0_`j' mrd01_`j' mrd1_`j'
}

* Create person means. PM = person mean
by user_id: egen pm_`var_a' = mean(`var_a')
by user_id: egen pm_`var_b' = mean(`var_b')
by user_id: egen pmd0_`var_a' = mean(mrd0_`var_a')
by user_id: egen pmd0_`var_b' = mean(mrd0_`var_b')
by user_id: egen pmd01_`var_a' = mean(mrd01_`var_a')
by user_id: egen pmd01_`var_b' = mean(mrd01_`var_b')
by user_id: egen pmd1_`var_a' = mean(mrd1_`var_a')
by user_id: egen pmd1_`var_b' = mean(mrd1_`var_b')

label var pm_`var_a' "Person mean for `var_a'"
label var pm_`var_b' "Person mean for `var_b'"
label var pmd0_`var_a' "Person mean for `var_a', earlier in day measures"
label var pmd0_`var_b' "Person mean for `var_b', earlier in day measures"
label var pmd01_`var_a' "Person mean for `var_a', previous wave measures"
label var pmd01_`var_b' "Person mean for `var_b', previous wave measures"
label var pmd1_`var_a' "Person mean for `var_a', day before measures"
label var pmd1_`var_b' "Person mean for `var_a', day before measures"

* Deviations from person mean, for different times
* Xij - XbarJ. This centers about the group mean, different for each person
gen dev_`var_a' = `var_a' - pm_`var_a'

```

```
gen dev_`var_b' = `var_b' - pm_`var_b'  
gen devd0_`var_a' = mrd0_`var_a' - pmd0_`var_a'  
gen devd0_`var_b' = mrd0_`var_b' - pmd0_`var_b'  
gen devd01_`var_a' = mrd01_`var_a' - pmd01_`var_a'  
gen devd01_`var_b' = mrd01_`var_b' - pmd01_`var_b'  
gen devd1_`var_a' = mrd1_`var_a' - pmd1_`var_a'  
gen devd1_`var_b' = mrd1_`var_b' - pmd1_`var_b'
```

```
label var dev_`var_a' "Deviation from person-mean of `var_a"  
label var dev_`var_b' "Deviation from person-mean of `var_b"  
label var devd0_`var_a' "Deviation from person-mean of mrd0_`var_a"  
label var devd0_`var_b' "Deviation from person-mean of mrd0_`var_b"  
label var devd01_`var_a' "Deviation from person-mean of mrd0_`var_a"  
label var devd01_`var_b' "Deviation from person-mean of mrd0_`var_b"  
label var devd1_`var_a' "Deviation from person-mean of mrd0_`var_a"  
label var devd1_`var_b' "Deviation from person-mean of mrd0_`var_b"
```

* Typical analyses might look like this

* Note: Always control for Sur-num, as there is a measurement effect

```
xtmixed `var_b' dev_`var_a' pm_`var_a' sur_num ||user_id:dev_`var_a', cov(un) ml  
estat ic
```