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> -----
      name: <unnamed>
      log:  H:\stata\RA task\output\health.log
      log type: text
      opened on: 24 Mar 2017, 15:02:20

. * import data and management
. import delimited using "$data\test_data.txt", varnames(1) clear
(6 vars, 8,831 obs)

. order visit_num, b(ed_tc)

. rename xb_lntdc lnStayLength

. egen physician = group(phys_name)

. capture noisily ssc install labutil
checking labutil consistency and verifying not already installed...
all files already exist and are up to date.

. labmask physician, values(phys_name)

. * change directory to "H:\stata\RA task\output"
. cd "$output"
H:\stata\RA task\output

. * generate date time of Arrival, order discharge, and shift
. gen double edArrival = clock(ed_tc, "DMY hms")

. format edArrival %tc

. gen double orderDischarge = clock(dcord_tc, "DMY hms")

. format orderDischarge %tc

. * check edArrival < orderDischarge
. gen errorCharge = 1 if edArrival >= orderDischarge
(8,827 missing values generated)

. sort(errorCharge) // 4 entry errors

. * shift begin
. gen beginHour_temp = substr(shiftid, 11, 7)

. gen beginHour_temp2 = beginHour_temp if beginHour_temp != "noon to"
(302 missing values generated)

. replace beginHour_temp2 = "12 p.m." if beginHour_temp == "noon to"
(302 real changes made)

. gen shiftBegin_temp = substr(shiftid, 1, 9) + " " + beginHour_temp2

. gen double shiftBegin = clock(shiftBegin_temp, "DMY h")

. format shiftBegin %tc

. * shift end
. gen endHour_temp = substr(shiftid, -7, .)

```

```

. gen endHour_temp2 = endHour_temp if endHour_temp != "to noon"
(1,524 missing values generated)

. replace endHour_temp2 = "12 p.m." if endHour_temp == "to noon"
(1,524 real changes made)

. gen shiftEnd_temp = substr(shiftid, 1, 9) + " " + endHour_temp2

. gen double shiftEnd_temp2 = clock(shiftEnd_temp, "DMY h")

. format shiftEnd_temp2 %tc

. * encode shiftid
. egen shift = group(shiftid)

. labmask shift, values(shiftid)

. * check shiftEnd >= shiftBegin
. gen errorShift = 1 if shiftEnd_temp2 < shiftBegin
(7,764 missing values generated)

. gen double shiftEnd = shiftEnd_temp2 if errorShift != 1
(1,067 missing values generated)

. replace shiftEnd = shiftEnd_temp2 + msofhours(24) if errorShift == 1
(1,067 real changes made)

. format shiftEnd %tc

. * check edArrial in interval [shiftBegin, shiftEnd]
. gen inShift = 1 if (edArrival >= shiftBegin)&(edArrival <= shiftEnd)
(650 missing values generated)

. * people who waits
. gen waiting_temp = 1 if mi(inShift)&(edArrival < shiftBegin)
(8,181 missing values generated)

```

```

. tab2 inShift waiting_temp, mi
-> tabulation of inShift by waiting_temp

```

| inShift | waiting_temp | | Total |
|---------|--------------|-------|-------|
| | 1 | . | |
| 1 | 0 | 8,181 | 8,181 |
| . | 650 | 0 | 650 |
| Total | 650 | 8,181 | 8,831 |

```

. drop waiting_temp

. gen waiting = 1 if mi(inShift)&(orderDischarge > shiftBegin)
(8,186 missing values generated)

. tab2 inShift waiting, mi
-> tabulation of inShift by waiting

```

| inShift | waiting | | Total |
|---------|---------|-------|-------|
| | 1 | . | |
| 1 | 0 | 8,181 | 8,181 |
| . | 645 | 5 | 650 |
| Total | 645 | 8,186 | 8,831 |

```

. * calculate the waiting minutes: divided by 60000 in STATA 14
. gen waitingMinutes = (shiftBegin - edArrival)/60000 if mi(inShift)
(8,181 missing values generated)

. sort(waitingMinutes)

. * drop unnecessary variables
. drop ed_tc dcoord_tc shiftid phys_name beginHour_temp-shiftBegin_temp ///
>      endHour_temp-shiftEnd_temp2 errorShift

. * data entry error that "edArrival > orderDischarge"
. drop if errorCharge == 1 // 4 entry errors
(4 observations deleted)

. * data entry error that [edArrival, orderDischarge] not in [shiftBegin, shiftEnd]
. drop if mi(waiting)&(!mi(waitingMinutes)) // 5 entry errors
(5 observations deleted)

. drop errorCharge inShift

. * treatment length in minutes
. gen treatmentLength = (orderDischarge - edArrival)/60000

. replace treatmentLength = (orderDischarge - edArrival)/60000 - waitingMinutes if !mi
> (waitingMinutes)
(645 real changes made)

.
. *Q1 summarize the data
. foreach var of varlist edArrival-shiftEnd {
2.      gen `var'Hour = hh(`var')
3. //      gen `var'Weekday =
. }

. * using outreg2 package to generate statistics output table
. outreg2 using stats.tex, replace sum(log) eqkeep(N mean sd min max p25 p50 p75) ///
>      keep(lnStayLength waitingMinutes-shiftEndHour
> r)

```

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|--------------|-------|----------|-----------|-----------|----------|
| visit_num | 8,822 | 4415.877 | 2549.566 | 1 | 8831 |
| lnStayLength | 8,822 | 1.121319 | .3817895 | -.2758868 | 2.124072 |
| physician | 8,822 | 20.62843 | 12.59838 | 1 | 43 |
| edArrival | 8,822 | 7.09e+11 | 1.53e+09 | 7.06e+11 | 7.11e+11 |
| orderDisch~e | 8,822 | 7.09e+11 | 1.53e+09 | 7.06e+11 | 7.11e+11 |
| shiftBegin | 8,822 | 7.09e+11 | 1.53e+09 | 7.06e+11 | 7.11e+11 |
| shift | 8,822 | 201.8215 | 114.2194 | 1 | 398 |
| shiftEnd | 8,822 | 7.09e+11 | 1.53e+09 | 7.06e+11 | 7.11e+11 |
| waiting | 645 | 1 | 0 | 1 | 1 |
| waitingMin~s | 645 | 26.9814 | 26.53843 | 1 | 238 |
| treatmentL~h | 8,822 | 240.723 | 252.9258 | 3 | 2211 |
| edArrivalH~r | 8,822 | 11.10655 | 5.331095 | 0 | 23 |
| orderDisch~r | 8,822 | 12.49807 | 5.505976 | 0 | 23 |
| shiftBegin~r | 8,822 | 9.341306 | 5.099234 | 3 | 19 |
| shiftHour | 8,822 | 0 | 0 | 0 | 0 |
| shiftEndHour | 8,822 | 15.54421 | 5.600948 | 4 | 22 |

```

stats.tex
dir : seeout

```

```
. * Q2 before and after shift
. gen afterShift = 1 if orderDischarge > shiftEnd
(7,147 missing values generated)
```

```
. tab2 waiting afterShift, missing
```

```
-> tabulation of waiting by afterShift
```

| waiting | afterShift | | Total |
|---------|------------|-------|-------|
| | 1 | . | |
| 1 | 59 | 586 | 645 |
| . | 1,616 | 6,561 | 8,177 |
| Total | 1,675 | 7,147 | 8,822 |

```
. * Q3 hourly pattern
. * yline = 1/24 = 0.042
. twoway (histogram edArrivalHour, graphregion(color(white)) xtitle("Hour of Patient V
> isit") ///
>                                     bcolor(green) yline(0.042) xlabel(0(2)23) width(1)
> discrete) (kdensity edArrivalHour,
> ///
>                                     legend(label(1 "Density Histogram") label(2 "K-den
> sity Curve"))) scheme(sicolor)
```

```
. graph export hourlyPattern.pdf, replace
(file hourlyPattern.pdf written in PDF format)
```

```
. tabout edArrivalHour using hourlyPattern.xls, replace cells(freq col)
```

```
Table output written to: hourlyPattern.xls
```

| edArrivalHour | No. | % |
|---------------|---------|-------|
| 0 | 132.0 | 1.5 |
| 1 | 114.0 | 1.3 |
| 2 | 142.0 | 1.6 |
| 3 | 156.0 | 1.8 |
| 4 | 345.0 | 3.9 |
| 5 | 409.0 | 4.6 |
| 6 | 619.0 | 7.0 |
| 7 | 617.0 | 7.0 |
| 8 | 617.0 | 7.0 |
| 9 | 504.0 | 5.7 |
| 10 | 572.0 | 6.5 |
| 11 | 519.0 | 5.9 |
| 12 | 573.0 | 6.5 |
| 13 | 567.0 | 6.4 |
| 14 | 517.0 | 5.9 |
| 15 | 440.0 | 5.0 |
| 16 | 465.0 | 5.3 |
| 17 | 377.0 | 4.3 |
| 18 | 293.0 | 3.3 |
| 19 | 230.0 | 2.6 |
| 20 | 161.0 | 1.8 |
| 21 | 161.0 | 1.8 |
| 22 | 138.0 | 1.6 |
| 23 | 154.0 | 1.7 |
| Total | 8,822.0 | 100.0 |

```

. * Q3 census
. gen double shiftLength_temp = (shiftEnd - shiftBegin)/(60*60000)

. tab shiftLength_temp, missing //shift length in [2h, 10h]

shiftLength |
  _temp |      Freq.      Percent      Cum.
-----+-----
          2 |          4          0.05          0.05
          7 |         17          0.19          0.24
          9 |       7,831      88.77          89.00
         10 |         970       11.00         100.00
-----+-----
        Total |      8,822      100.00

. drop shiftLength_temp

. gen double inTreat = (edArrival - shiftEnd)/(60*60000)

. replace inTreat = (shiftBegin - shiftEnd)/(60*60000) if waiting == 1
(645 real changes made)

. gen double outTreat = (orderDischarge - shiftEnd)/(60*60000)

. gen double outTreat_temp = outTreat

. replace outTreat = 4 if outTreat_temp >= 4
(629 real changes made)

. drop outTreat_temp

.
.
. forvalues i = 0/10 {
2.     if (`i' >= 1) & (`i' <= 3) {
3.         gen indexPos`i' = 0
4.         gen indexNeg`i' = 0
5.     }
6.     else if `i' >=4 {
7.         gen indexNeg`i' = 0
8.     }
9.     else {
10.        gen index0 = 0
11.        replace index0 = 1 if (0 >= inTreat)&(outTreat >=0)
12.    }
13. }
(1,686 real changes made)

. forvalues i =1/3 {
2.     replace indexPos`i' = 1 if (`i' >= inTreat)&(outTreat >= `i' )
3. }
(1,211 real changes made)
(920 real changes made)
(742 real changes made)

. forvalues i = 1/10 {
2.     replace indexNeg`i' = 1 if (-`i' >= inTreat)&(outTreat >= -`i')
3. }
(2,535 real changes made)
(3,384 real changes made)
(3,893 real changes made)
(4,207 real changes made)
(3,991 real changes made)
(3,289 real changes made)
(2,593 real changes made)
(1,832 real changes made)
(786 real changes made)
(46 real changes made)

```

```

. preserve

.      collapse (sum) index0 indexNeg* indexPos*, by(physician shift)

.      save "Census.txt", replace
file Census.txt saved

.      rename index0 index10

.      rename indexPos1 index11

.      rename indexPos2 index12

.      rename indexPos3 index13

.      rename indexNeg10 index0

.      rename indexNeg9 index1

.      rename indexNeg8 index2

.      rename indexNeg7 index3

.      rename indexNeg6 index4

.      rename indexNeg5 index5

.      rename indexNeg4 index6

.      rename indexNeg3 index7

.      rename indexNeg2 index8

.      rename indexNeg1 index9

.      order physician shift index0 index1 index2 index3 index4 index5 ///
>      index6 index7 index8 index9 index10 index11 index12 index13

.      reshape long index, i(physician shift) j(indexCo)
(note: j = 0 1 2 3 4 5 6 7 8 9 10 11 12 13)

Data                                wide    ->    long
-----
Number of obs.                      530      ->    7420
Number of variables                  16      ->      4
j variable (14 values)              ->    indexCo
xij variables:
      index0 index1 ... index13      ->    index
-----

.      rename index numPatient

.      gen int index = indexCo -10

.      drop indexCo

.      graph box numPatient, over(index) nooutsides graphregion(color(white)) ///
>      scheme(s1color)

.      graph export numPatient.pdf, replace
(file numPatient.pdf written in PDF format)

```

```

.      save "Census_reshaped.txt", replace
file Census_reshaped.txt saved

. restore

. * Q4 regression
. preserve

.      graph hbox lnStayLength, over(physician, label(labsize(vsmall))) ///
>      nooutsides graphregion(color(white)) scheme(slcolor)

.      graph export lnStayLength.pdf, replace
(file lnStayLength.pdf written in PDF format)

.      replace waiting = 0 if mi(waiting)
(8,177 real changes made)

.      capture ssc install estout

.      eststo: reg lnStayLength i.physician, robust

```

```

Linear regression      Number of obs      =      8,822
                      F(42, 8779)          =      1.63
                      Prob > F              =      0.0060
                      R-squared             =      0.0071
                      Root MSE           =      .38135

```

| lnStayLength | Coef. | Robust Std. Err. | t | P> t | [95% Conf. Interval] | |
|--------------|-----------|------------------|-------|-------|----------------------|-----------|
| physician | | | | | | |
| Andrew | -.0727343 | .0369878 | -1.97 | 0.049 | -.1452391 | -.0002296 |
| Anne | -.0446675 | .0374953 | -1.19 | 0.234 | -.1181671 | .0288321 |
| Audrey | -.0137466 | .0349799 | -0.39 | 0.694 | -.0823153 | .0548221 |
| Barack | -.0602813 | .0367082 | -1.64 | 0.101 | -.132238 | .0116753 |
| Beatrice | -.0463377 | .0328194 | -1.41 | 0.158 | -.1106715 | .0179961 |
| Benazir | -.0564306 | .0384827 | -1.47 | 0.143 | -.1318657 | .0190046 |
| Benjamin | -.0149364 | .0345559 | -0.43 | 0.666 | -.0826741 | .0528013 |
| Bill | -.0191083 | .0356726 | -0.54 | 0.592 | -.0890349 | .0508183 |
| Calvin | -.0089376 | .0333654 | -0.27 | 0.789 | -.0743416 | .0564663 |
| Chester | -.008359 | .0434955 | -0.19 | 0.848 | -.0936203 | .0769023 |
| Diana | -.061712 | .0355313 | -1.74 | 0.082 | -.1313617 | .0079377 |
| Dwight | -.0708874 | .0341918 | -2.07 | 0.038 | -.1379113 | -.0038635 |
| Eleanor | .0661661 | .0404917 | 1.63 | 0.102 | -.0132071 | .1455393 |
| Elizabeth | -.0745835 | .0512702 | -1.45 | 0.146 | -.1750852 | .0259181 |
| Franklin | -.0210292 | .0354729 | -0.59 | 0.553 | -.0905644 | .0485061 |
| George | .0399753 | .0359277 | 1.11 | 0.266 | -.0304514 | .1104021 |
| Gerald | -.035441 | .0331704 | -1.07 | 0.285 | -.1004627 | .0295807 |
| Grover | -.0237483 | .0383241 | -0.62 | 0.535 | -.0988726 | .051376 |
| Harry | -.0074512 | .0336951 | -0.22 | 0.825 | -.0735015 | .0585991 |
| Herbert | -.0304386 | .0416703 | -0.73 | 0.465 | -.112122 | .0512449 |
| Hillary | .0355887 | .0375879 | 0.95 | 0.344 | -.0380924 | .1092697 |
| Ingrid | -.0376234 | .0340762 | -1.10 | 0.270 | -.1044207 | .029174 |
| Jacqueline | .0472737 | .0416862 | 1.13 | 0.257 | -.0344411 | .1289885 |
| James | -.0391022 | .0424765 | -0.92 | 0.357 | -.1223662 | .0441617 |
| Jimmy | .0285814 | .0362431 | 0.79 | 0.430 | -.0424635 | .0996263 |
| John | -.0183244 | .0394438 | -0.46 | 0.642 | -.0956435 | .0589946 |
| Kate | -.0073104 | .0387641 | -0.19 | 0.850 | -.083297 | .0686763 |
| Katharine | .0255273 | .0486831 | 0.52 | 0.600 | -.0699029 | .1209576 |
| Lyndon | -.0331063 | .0405692 | -0.82 | 0.414 | -.1126314 | .0464188 |
| Martin | -.017995 | .0334552 | -0.54 | 0.591 | -.0835749 | .047585 |
| Oprah | .0012016 | .0366863 | 0.03 | 0.974 | -.0707121 | .0731153 |
| Richard | .0162879 | .039554 | 0.41 | 0.681 | -.0612472 | .0938229 |
| Ronald | -.0483119 | .0371717 | -1.30 | 0.194 | -.1211771 | .0245533 |
| Teresa | -.1035178 | .0421702 | -2.45 | 0.014 | -.1861812 | -.0208544 |
| Thomas | -.0518394 | .087066 | -0.60 | 0.552 | -.2225091 | .1188304 |
| Ulysses | .0404558 | .0400552 | 1.01 | 0.313 | -.0380619 | .1189735 |
| Victoria | .159606 | .1192065 | 1.34 | 0.181 | -.0740666 | .3932786 |
| Virginia | -.029011 | .0352077 | -0.82 | 0.410 | -.0980263 | .0400044 |
| Warren | -.0235964 | .0345579 | -0.68 | 0.495 | -.091338 | .0441453 |
| Whoopi | -.0265169 | .0325856 | -0.81 | 0.416 | -.0903924 | .0373585 |

| | | | | | | |
|---------|-----------|----------|-------|-------|-----------|----------|
| William | -.0324227 | .0395316 | -0.82 | 0.412 | -.109914 | .0450685 |
| Woodrow | .0085202 | .0371523 | 0.23 | 0.819 | -.0643071 | .0813474 |
| _cons | 1.144362 | .0260354 | 43.95 | 0.000 | 1.093327 | 1.195397 |

(est1 stored)

. eststo: reg lnStayLength i.physician waiting inTreat, robust

| | | | |
|-------------------|---------------|---|--------|
| Linear regression | Number of obs | = | 8,822 |
| | F(44, 8777) | = | 2.03 |
| | Prob > F | = | 0.0001 |
| | R-squared | = | 0.0093 |
| | Root MSE | = | .38097 |

| lnStayLength | Coef. | Robust Std. Err. | t | P> t | [95% Conf. Interval] |
|--------------|-----------|------------------|-------|-------|----------------------|
| physician | | | | | |
| Andrew | -.0738492 | .0370431 | -1.99 | 0.046 | -.1464624 |
| Anne | -.0445541 | .0374504 | -1.19 | 0.234 | -.1179657 |
| Audrey | -.0141326 | .0349885 | -0.40 | 0.686 | -.0827182 |
| Barack | -.0596241 | .0366632 | -1.63 | 0.104 | -.1314926 |
| Beatrice | -.0481565 | .0327734 | -1.47 | 0.142 | -.1123999 |
| Benazir | -.0568227 | .0384537 | -1.48 | 0.140 | -.1322009 |
| Benjamin | -.0156902 | .03454 | -0.45 | 0.650 | -.0833967 |
| Bill | -.01947 | .0356786 | -0.55 | 0.585 | -.0894085 |
| Calvin | -.0099386 | .0333599 | -0.30 | 0.766 | -.0753318 |
| Chester | -.0098227 | .0434075 | -0.23 | 0.821 | -.0949116 |
| Diana | -.061232 | .0355291 | -1.72 | 0.085 | -.1308774 |
| Dwight | -.0724508 | .0341064 | -2.12 | 0.034 | -.1393072 |
| Eleanor | .0663982 | .0403613 | 1.65 | 0.100 | -.0127193 |
| Elizabeth | -.0751061 | .0512858 | -1.46 | 0.143 | -.1756384 |
| Franklin | -.0200896 | .0353764 | -0.57 | 0.570 | -.0894356 |
| George | .0369983 | .0359882 | 1.03 | 0.304 | -.0335469 |
| Gerald | -.036124 | .0331581 | -1.09 | 0.276 | -.1011218 |
| Grover | -.0236368 | .0382425 | -0.62 | 0.537 | -.098601 |
| Harry | -.0096555 | .0336259 | -0.29 | 0.774 | -.0755701 |
| Herbert | -.0305959 | .0414223 | -0.74 | 0.460 | -.1117933 |
| Hillary | .036076 | .0374952 | 0.96 | 0.336 | -.0374235 |
| Ingrid | -.0402943 | .0340288 | -1.18 | 0.236 | -.1069988 |
| Jacqueline | .0481499 | .0416537 | 1.16 | 0.248 | -.033501 |
| James | -.038995 | .0423798 | -0.92 | 0.358 | -.1220693 |
| Jimmy | .0266054 | .0362381 | 0.73 | 0.463 | -.0444298 |
| John | -.0217294 | .0393546 | -0.55 | 0.581 | -.0988737 |
| Kate | -.0128075 | .0388648 | -0.33 | 0.742 | -.0889915 |
| Katharine | .0222192 | .0489231 | 0.45 | 0.650 | -.0736815 |
| Lyndon | -.0326999 | .0404213 | -0.81 | 0.419 | -.1119351 |
| Martin | -.0178903 | .0333593 | -0.54 | 0.592 | -.0832824 |
| Oprah | -.0011257 | .0366235 | -0.03 | 0.975 | -.0729164 |
| Richard | .0174218 | .0395655 | 0.44 | 0.660 | -.0601358 |
| Ronald | -.0493464 | .0369957 | -1.33 | 0.182 | -.1218667 |
| Teresa | -.1037624 | .0422322 | -2.46 | 0.014 | -.1865474 |
| Thomas | -.0592282 | .0872672 | -0.68 | 0.497 | -.2302923 |
| Ulysses | .0370339 | .04002 | 0.93 | 0.355 | -.0414146 |
| Victoria | .1750968 | .1170402 | 1.50 | 0.135 | -.0543293 |
| Virginia | -.0295597 | .0351346 | -0.84 | 0.400 | -.0984318 |
| Warren | -.0234847 | .0345721 | -0.68 | 0.497 | -.0912542 |
| Whoopi | -.027461 | .0325963 | -0.84 | 0.400 | -.0913573 |
| William | -.0313322 | .0392576 | -0.80 | 0.425 | -.1082863 |
| Woodrow | .0094543 | .0371101 | 0.25 | 0.799 | -.0632902 |
| waiting | .0110957 | .0163428 | 0.68 | 0.497 | -.0209401 |
| inTreat | -.007936 | .0021942 | -3.62 | 0.000 | -.0122372 |
| _cons | 1.096532 | .0289503 | 37.88 | 0.000 | 1.039783 |

(est2 stored)


```
.      esttab using reg.tex, replace label drop(_cons)
(note: file reg.tex not found)
(output written to reg.tex)

. restore

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```