Stata’s `ml` command can fit maximum likelihood–based models for survey data. Many `ml`-based estimators can now be modified to handle one or more stages of clustering, stratification, sampling weights, finite population correction, calibration, poststratification, and subpopulation estimation. See [R] `ml` for details.

See [P] `program properties` for a discussion of the programming requirements for an estimation command to work with the `svy` prefix. See Gould, Pitblado, and Poi (2010) for examples of community-contributed estimation commands that support the `svy` prefix.

### Example 1: User-written survey regression

The `ml` command requires a program that computes likelihood values to perform maximum likelihood. Here is a likelihood evaluator used in Gould, Pitblado, and Poi (2010) to fit linear regression models using likelihood from the normal distribution.

```stata
program mynormal_lf
    version 15.1
    args lnf mu lnsigma
    quietly replace `lnf' = ln(normalden($ML_y1,'mu',exp('lnsigma')))
end
```

Here we fit a survey regression model using a multistage survey dataset with `ml` and the above likelihood evaluator.

```stata
use http://www.stata-press.com/data/r15/multistage
svyset county [pw=sampwgt], strata(state) fpc(ncounties) || school, fpc(nschools)
    pweight: sampwgt
        VCE: linearized
Single unit: missing
Strata 1: state
    SU 1: county
        FPC 1: ncounties
Strata 2: <one>
    SU 2: school
        FPC 2: nschools
.ml model lf mynormal_lf (mu: weight = height) /lnsigma, svy
```
. ml maximize

  initial:  log pseudolikelihood =  -<inf> (could not be evaluated)
  feasible: log pseudolikelihood =  -7.301e+08
  rescale:  log pseudolikelihood =  -5194380
  rescale eq: log pseudolikelihood =  -4756531
  Iteration 0:  log pseudolikelihood =  -4756531
  Iteration 1:  log pseudolikelihood =  -41226725 (not concave)
  Iteration 2:  log pseudolikelihood =  -41221650 (not concave)
  Iteration 3:  log pseudolikelihood =  -41176159 (not concave)
  Iteration 4:  log pseudolikelihood =  -41154139 (not concave)
  Iteration 5:  log pseudolikelihood =  -41052368
  Iteration 6:  log pseudolikelihood =  -39379181 (backed up)
  Iteration 7:  log pseudolikelihood =  -38333242
  Iteration 8:  log pseudolikelihood =  -38328742
  Iteration 9:  log pseudolikelihood =  -38328739

Number of strata = 50  Number of obs = 4,071
Number of PSUs = 100  Population size = 8,000,000
Design df = 50
F( 1,  50) = 593.99
Prob > F =  0.0000

               Linearized
          weight |   Coef.  Std. Err.     t    P>|t|     [95% Conf. Interval]
-----------|----------|---------|-----------|---------|
    height  |  .716311  .0293908  24.37  0.000    .6572778    .7753442
     _cons  | -149.6181  12.57266 -11.90  0.000  -174.871  -124.3652
    /lnsigma|  3.372153  .0180777  186.54  0.000    3.335843    3.408464

Reference

Also see
[P] program properties — Properties of user-defined programs
[R] maximize — Details of iterative maximization
[R] ml — Maximum likelihood estimation
[SVY] survey — Introduction to survey commands