Example 3: Linear Regression

In the following sample code, Body Mass Index (bmi_p) is examined in relation to race (racehr2), sex (srsex), and age (srage_p) while controlling for each other. Note that racehr2 and srsex are categorical variables; White (racehr2=6) and Male (srsex=1) are used as their reference categories.

**SAS:**

```sas
PROC SURVEYREG DATA = data VARMETHOD=JACKKNIFE;
  WEIGHT rakedw0;
  REPWEIGHT rakedw1-rakedw80/JKCOEFS=1;  a
  FORMAT racehr2 racehrf. srsex srsex.;
  CLASS racehr2 srsex;
  MODEL bmi_p = srsex racehr2 srage_p/SOLUTION;  c
RUN;
```

* Jackknife coefficients are necessary for accurate variance calculations, and jackknife coefficients of 1 in SAS will produce equal variance calculations as those produced in SUDAAN. However, for SAS V.9.2(TS1M0) and earlier, a value of 1 will not be accepted; as a substitute, 0.9999 can be entered. Without this specification, the default value of the jackknife coefficients will be [(# replicate weights - 1)/# replicate weights]; for CHIS, this would be [(80 - 1)/80] = 0.9875.
  
* When the values are formatted either in the data step or in the procedure, SAS automatically picks the category of the categorical variables whose label is alphabetically last as a reference group.
  
* SOLUTION option provides the parameter estimates when using a CLASS statement.

**SUDAAN:**

```sas
PROC REGRESS DATA = data FILETYPE=SAS DESIGN=JACKKNIFE;
  WEIGHT rakedw0;
  JACKWGTS rakedw1-rakedw80/ADJJACK=1;
  SUBGROUP racehr2 srsex;
  LEVELS 7 2;
  REFLEVEL racehr2=6 srsex=1;
  MODEL bmi_p = racehr2 srsex srage_p;
RUN;
```

**Stata:**

```stata
*Sample design specification step*  d
use "DATASET LOCATION"
svyset [pw=rakedw0], jkrw(rakedw1-rakedw80, multiplier(1)) vce(jack)
mse

*Analysis*
recode racehr2 (6=1) (1=2) (2=3) (3=4) (4=5) (5=6) (7=7), gen(race)  e
xi: svy: regress bmi_p i.srsex i.race srage_p
```

* In Stata, the sample design specification step should be included before conducting any analysis.
* Recoding is done in order to choose “White” (racehr2=6) as the reference group.