```sas

/\* SAS Example: One-Sample T-Test \*/

proc ttest data=bp\_data;

var blood\_pressure;

/\* Null Hypothesis: Mean blood pressure is 0 \*/

nullmean=0;

run;

```

```sas

/\* SAS Example: One-Way ANOVA \*/

proc anova data=scores;

class teaching\_method;

model test\_scores = teaching\_method;

run;

```

```sas

/\* SAS Example: Wilcoxon Rank-Sum Test \*/

proc npar1way data=scores wilcoxon;

class group;

var test\_scores;

run;

```

```sas

/\* SAS Example: Linear Regression \*/

proc reg data=scores;

model test\_scores = study\_hours;

run;

```

```sas

proc ttest data=mydata;

class Group;

var Score;

run;

```

```sas

proc ttest data=mydata;

paired Before\*After;

run;

```

```sas

proc ttest data=mydata;

var Measurement;

/\* specify the hypothesized mean \*/

h0 = 50;

/\* one-sample t-test against the hypothesized mean \*/

ttest test=h0;

run;

```

```sas

proc anova data=mydata;

class Group;

model Score = Group;

run;

```

```sas

proc anova data=mydata;

class FactorA FactorB;

model Score = FactorA|FactorB;

run;

```

```sas

proc mixed data=mydata;

class Subject Time;

model Score = Time;

repeated / subject=Subject type=un;

run;

```

```sas

proc freq data=mydata;

tables Category / chisq;

run;

```

```sas

proc freq data=mydata;

tables Category1\*Category2 / chisq;

run;

```

```sas

proc freq data=mydata;

tables Category\*Group / chisq;

run;

```

```sas

proc reg data=mydata;

model DependentVar = IndependentVar;

run;

```

```sas

proc reg data=mydata;

model DependentVar = IndependentVar1 IndependentVar2;

run;

```

```sas

proc reg data=exams;

model Score = HoursStudied;

run;

```

```sas

proc reg data=exams;

model Score = HoursStudied PrepExams;

run;

```

```sas

proc reg data=mydata;

model Y = X;

scatter x=X y=Y / fitted;

run;

```

```sas

proc autoreg data=mydata;

model Y = X;

run;

```

```sas

proc reg data=mydata;

model Y = X;

scatter x=X y=residual / spreadreg;

run;

```

```sas

proc univariate data=mydata normal;

var residual;

run;

```

```sas

proc reg data=mydata;

model Y = X;

output out=residuals residual=r;

run;

proc sgplot data=residuals;

scatter x=X y=r / markerattrs=(symbol=circlefilled);

refline 0 / lineattrs=(color=red);

run;

```

```sas

proc reg data=mydata;

model Y = X1 X2;

test X1 = 0, X2 = 0; /\* Null hypothesis: Coefficient is equal to zero \*/

run;

```

```sas

proc reg data=mydata;

model Y = X1 X2;

test / dfnum=2; /\* Number of variables being tested \*/

run;

```

```sas

proc logistic data=mydata;

model Outcome(event='1') = X1 X2;

run;

```

```sas

proc reg data=mydata;

model Y = X1 X1\*X1; /\* Quadratic term \*/

run;

```

```sas

/ Hypothesis Testing - Paired T-Test /

proc ttest data=mydata;

paired Before After;

run;

/ Regression Analysis /

proc reg data=mydata;

model Sales = MarketingExpenses / clb;

run;

```

```sas

/\* Checking Normality Assumption \*/

proc univariate data=mydata normal;

var Residuals;

run;

/\* Detecting Multicollinearity \*/

proc reg data=mydata;

model Y = X1 X2 X3;

vif;

run;

```

```sas

/\* Data Cleaning and Preprocessing \*/

proc sort data=mydata; by ID; run;

proc delete data=cleaned\_data; run;

data cleaned\_data; set mydata; /\* Apply cleaning steps \*/ run;

/\* Variable Selection \*/

proc reg data=cleaned\_data;

model Y = X1 X2 X3 / selection=stepwise;

run;

/\* Validation and Sensitivity Analysis \*/

/\* Perform residual analysis, check influential points, etc. \*/

```

```sas

/\* Hyperparameter Tuning in SAS Viya \*/

proc cas;

sessionCasLib 'casuser' caslib='casuser';

regression.sgb(

table={name='mydata' caslib='casuser'},

inputs={'X1', 'X2', 'X3'},

target='Y',

nominals={'X4'},

varimp={casout={name='varimp' caslib='casuser'}}

);

run;

```

```sas

/\* L1 Regularization in SAS Viya \*/

proc cas;

sessionCasLib 'casuser' caslib='casuser';

regression.glm(

table={name='mydata' caslib='casuser'},

inputs={'X1', 'X2', 'X3'},

target='Y',

selection=lasso

);

run;

```