```
*;
*;
* HBAT - Principal Components Analysis;
*;
    ods graphics on;
*;
options ls=80 ps=50 nodate pageno=1;
*;
* Input HBAT ;
*;
Data HBAT;
Infile 'N:\BIA652C_Multivariate Data Analysis_Spring 2016\Class_06-07_Chap
3\HBAT_tabs.txt' DLM = '09'X TRUNCOVER;
Input ID X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18 X19
X20 X21 X22 X23;
*;
Data HBAT;
      Set HBAT (Keep = X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18);
      Label X6 = 'X6 - Product Quality'
            X7 = 'X7 - E-Commerce'
          X8 = 'X8 - Technical Support'
          X9 = 'X9 - Complaint Resolution'
          X10 = 'X10 - Advertizing'
          X11 = 'X11 - Product Line'
          X12 = 'X12 - Salesforce Image'
          X13 = 'X13 - Competitive Pricing'
          X14 = 'X14 - Warranty & Claims'
          X15 = 'X15 - New Products'
          X16 = 'X16 - Order & Billing'
          X17 = 'X17 - Price Flexibility'
          X18 = 'X18 - Delivery Speed';
*;
Proc Print Data = HBAT;
*;
* Principal Components Analysis - All Variables;
*;
Proc Princomp Data = HBAT Plots = ALL;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18;
*;
*;
************ All Variables - Method=Principal Rotation: None and Varimax
***************;
*;
* Exploratory Factor Analysis Rotate=NONE All Variables ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=None NFactors=5 Simple MSA
Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18;
*;
* Exploratory Factor Analysis Rotate=Varimax All Variables ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=Varimax NFactors=5 Print
Score Simple MSA Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16 X17 X18;
*;
*;
```

```
************ X15 Deleted - Method=Principal Rotation: None and Varimax
****************;
*;
* Exploratory Factor Analysis Rotate=NONE X15 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=None NFactors=4 Simple MSA
Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X16 X17 X18;
*;
* Exploratory Factor Analysis Rotate=Varimax X15 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=Varimax NFactors=4 Print
Score Simple MSA Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X16 X17 X18;
*;
*;
************ X15 & X17 Deleted - Method=Principal Rotation: None and Varimax
****************;
*;
* Exploratory Factor Analysis Rotate=NONE X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=None NFactors=4 Simple MSA
Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X16 X18;
*;
* Exploratory Factor Analysis Rotate=Varimax X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=Varimax NFactors=4 Print
Score Simple MSA Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X11 X12 X13 X14 X16 X18;
*;
*;
************ X11, X15 & X17 Deleted - Method=Principal Rotation: None and
Varimax ****************;
*;
* Exploratory Factor Analysis Rotate=NONE X11, X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=None NFactors=4 Simple Corr
MSA Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
* Exploratory Factor Analysis Rotate=Varimax X11, X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=Varimax NFactors=4 Print
Score Simple Corr MSA Plots = ALL MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
*;
************  Compute Factor and Summated Scores****************;
*;
Proc Factor Data = HBAT Outstat=FactOut Method=Principal Rotate=Varimax
NFactors=4 Print Score Simple MSA Plots = ALL MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
Proc Score Data=HBAT Score=FactOut Out=FScore;
     Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
Proc Print Data = FactOut;
```

```
*;
Proc Print Data = FScore;
*;
Data FScore;
      Set FScore;
      Label SumScale1 = 'SumScale1 - Postsale Customer Servicey'
            SumScale2 = 'SumScale2 - Marketing'
          SumScale3 = 'SumScale3 -- Technical Support'
          SumScale4 = 'SumScale4 -- Product Value';
      SumScale1 = (X9 + X18 + X16) / 3;
      SumScale2 = (X12 + X7 + X10) / 3;
      SumScale3 = (X8 + X14) / 2;
      SumScale4 = (X6 + (10-X13)) / 2;
*;
Proc Print Data = FScore;
*;
Proc Means Data = FScore;
   Var Factor1 Factor2 Factor3 Factor4 SumScale1 SumScale2 SumScale3
SumScale4;
*;
*;
************  Compute Factor and Summated Correlations ***************;
*;
Proc Corr Data = FScore;
   Var Factor1 Factor2 Factor3 Factor4 SumScale1 SumScale2 SumScale3
SumScale4;
*;
*;
**** STOP Examples HERE ********;
*;
************ X11, X15 & X17 Deleted - Method=Principal Rotation: None and
Varimax ***************;
*;
* Exploratory Factor Analysis Rotate=NONE X11, X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=None NFactors=5 Simple Corr
MSA Plots = Scree MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
* Exploratory Factor Analysis Rotate=Varimax X11, X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=Varimax NFactors=5 Print
Score Simple Corr MSA Plots = ALL MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
*;
************ X11, X15 & X17 Deleted - Method=Principal Rotation: Promax(3)
***************;
*;
* Exploratory Factor Analysis Rotate=NONE X11, X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=Principal Rotate=Promax(3) NFactors=4 Print
Score Simple Corr MSA Plots = ALL MINEIGEN=0 Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
*;
```

```
************ X11, X15 & X17 Deleted - Method=PRINIT Rotation: NONE and
Varimax ****************;
*;
* Exploratory Factor Analysis Method = PRINIT Rotate=NONE X11, X15 & X17
Deleted ;
*;
Proc Factor Data = HBAT Method=PRINIT Rotate=NONE NFactors=3 Simple Corr MSA
Plots = Scree MINEIGEN=0 Priors=SMC Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
* Exploratory Factor Analysis Rotate=Varimax X11, X15 & X17 Deleted ;
*;
Proc Factor Data = HBAT Method=PRINIT Rotate=Varimax NFactors=3 Print Score
Simple Corr MSA Plots = ALL MINEIGEN=0 Priors=SMC Reorder;
    Var X6 X7 X8 X9 X10 X12 X13 X14 X16 X18;
*;
*;
*     ods graphics off;
*;
*;
Run;
Quit;
```