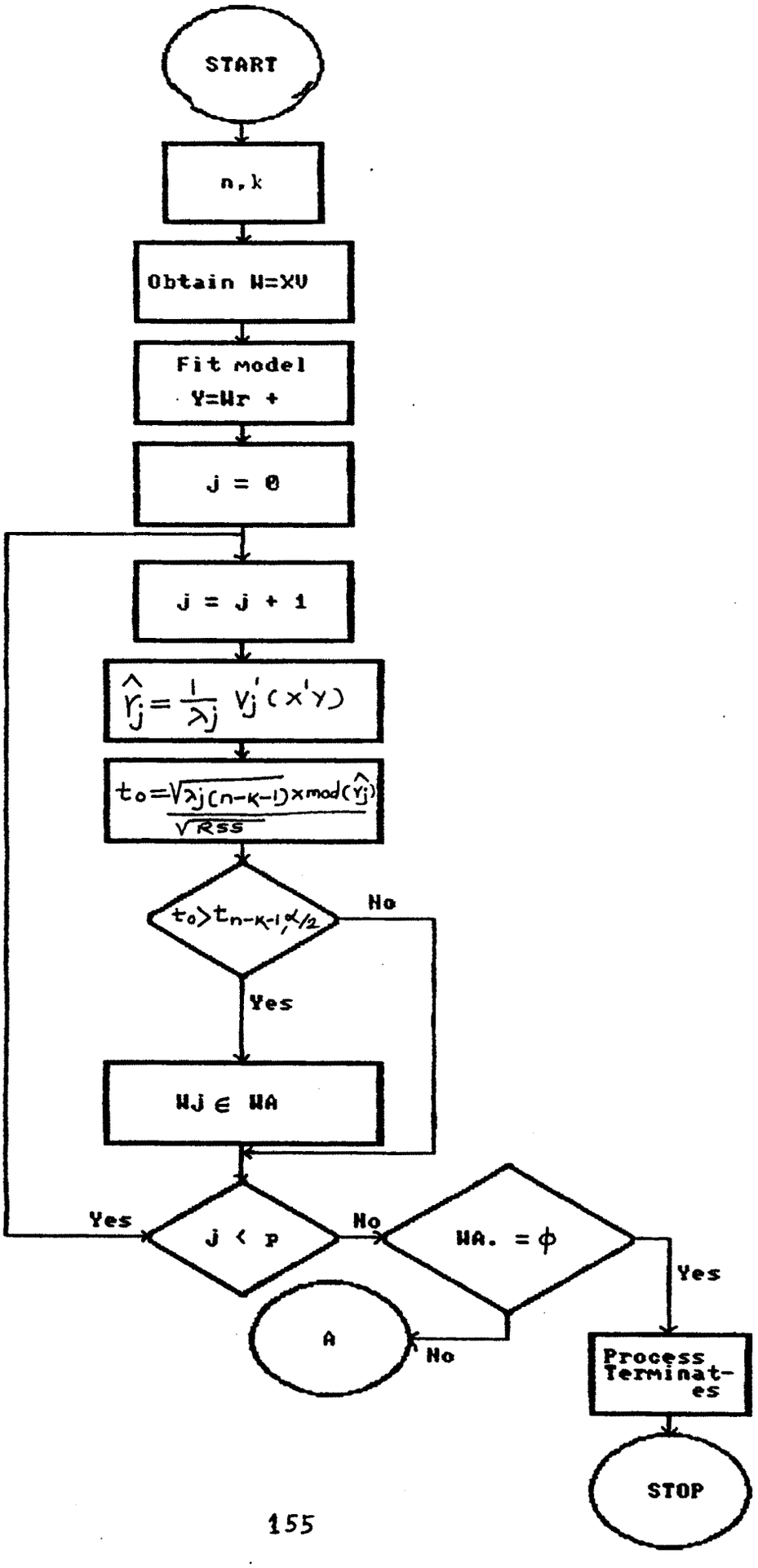
APPENDIX

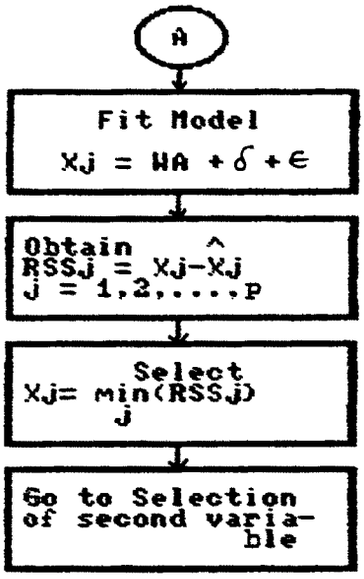
APPENDIX

Selection method of subset by using principal components by means of flow chart. In Appendix (A), we give flow chart for selection of first variable out of k independent variables. Here we assume that variable X_1 is selected at first step. In Appendix(B), we give flow chart for selection of second variables out of (k-1) independent variables. Here we assume that variable X_2 is selected at second step. After selection second variable, we verify whether variable X_1 is included in the model or dropped from the model. The flow chart for verification is given in Appendix(C).

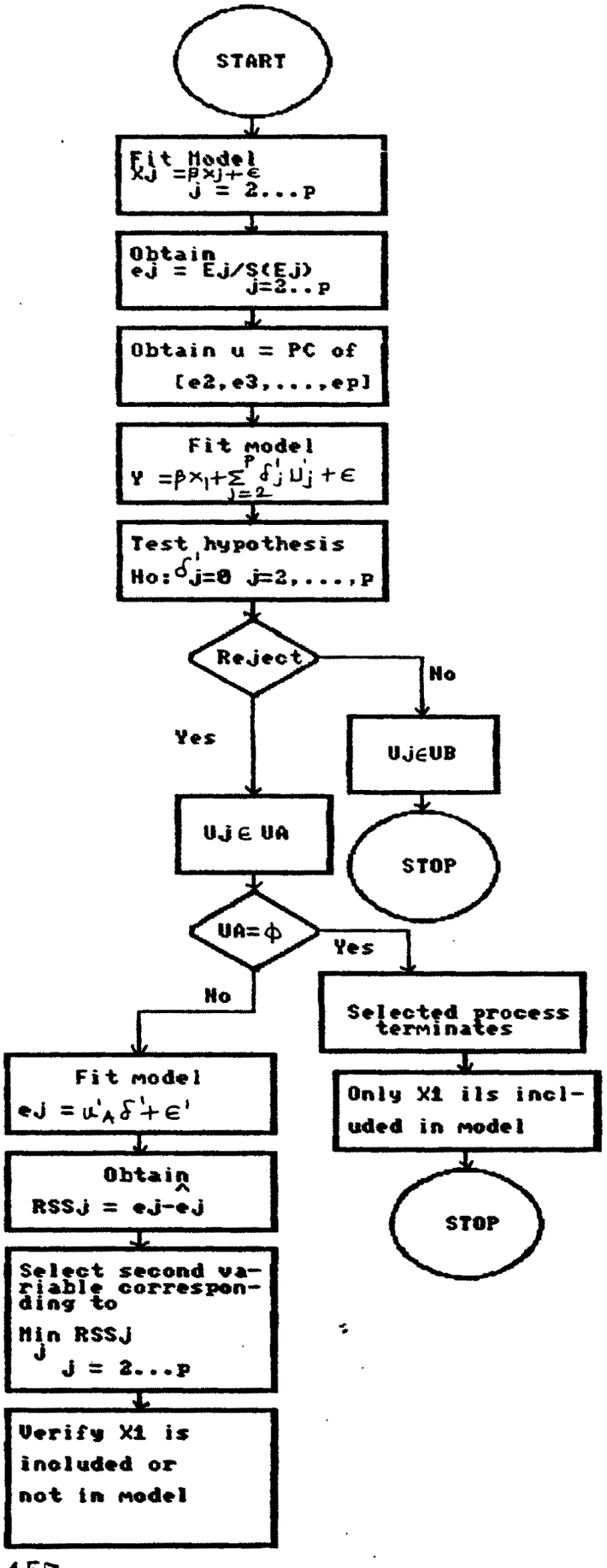
In Appendix(D), we have flow chart for general procedure by assuming the $X_{(A)}$ is set of previously selected variables and $X_{(B)}$ is set consisting of unselected variables.

Appendix (A).

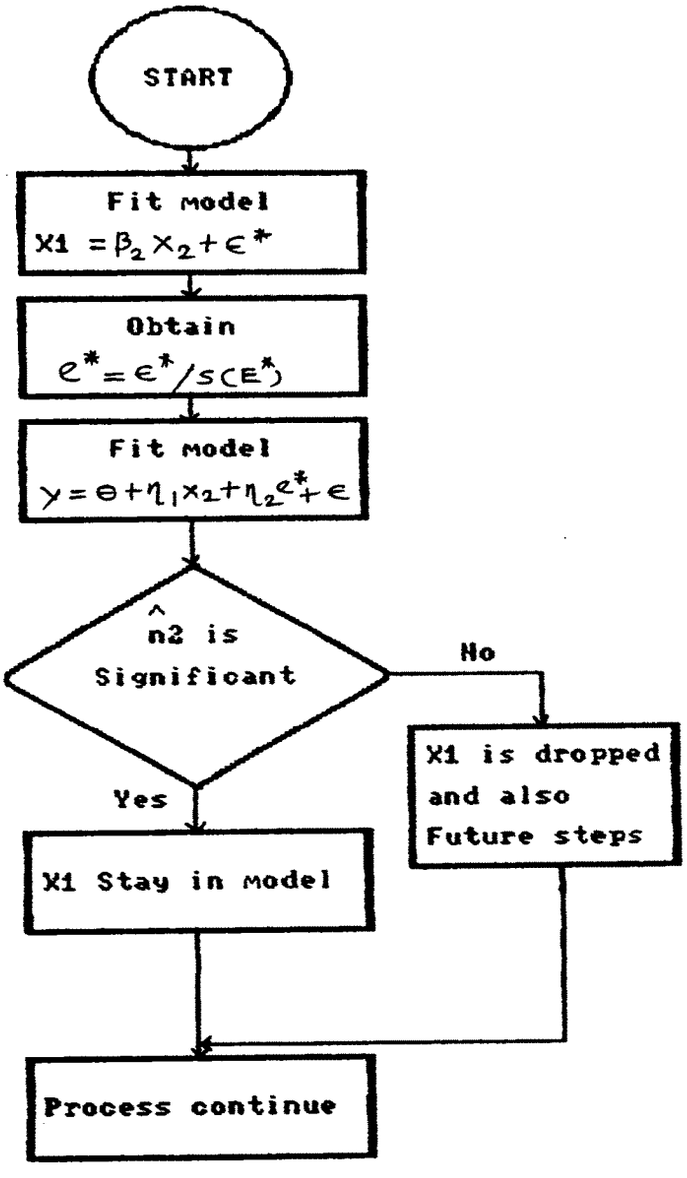

START
n, k
Obtain W=XV
Fit model
Y=Wr +
j = 0
j = j + 1
$\hat{r}_j = \frac{1}{\lambda_j} v_j'(x'y)$
$t_0 = \frac{\sqrt{\lambda_j (n-k-1)} \times mod(\hat{r}_j)}{\sqrt{RSS}}$
$t_0 > t_{n-k-1, \alpha/2}$
No
Yes
Wj ∈ WA
Yes
j < p
No
WA. = ϕ
Yes
A
No
Process Terminat-es
STOP


A
Fit Model
Xj = WA + δ + ∈
Obtain
RSSj = Xj-Xj
j = 1,2,....p
Select
Xj= min(RSSj)
j
Go to Selection
of second varia-
ble

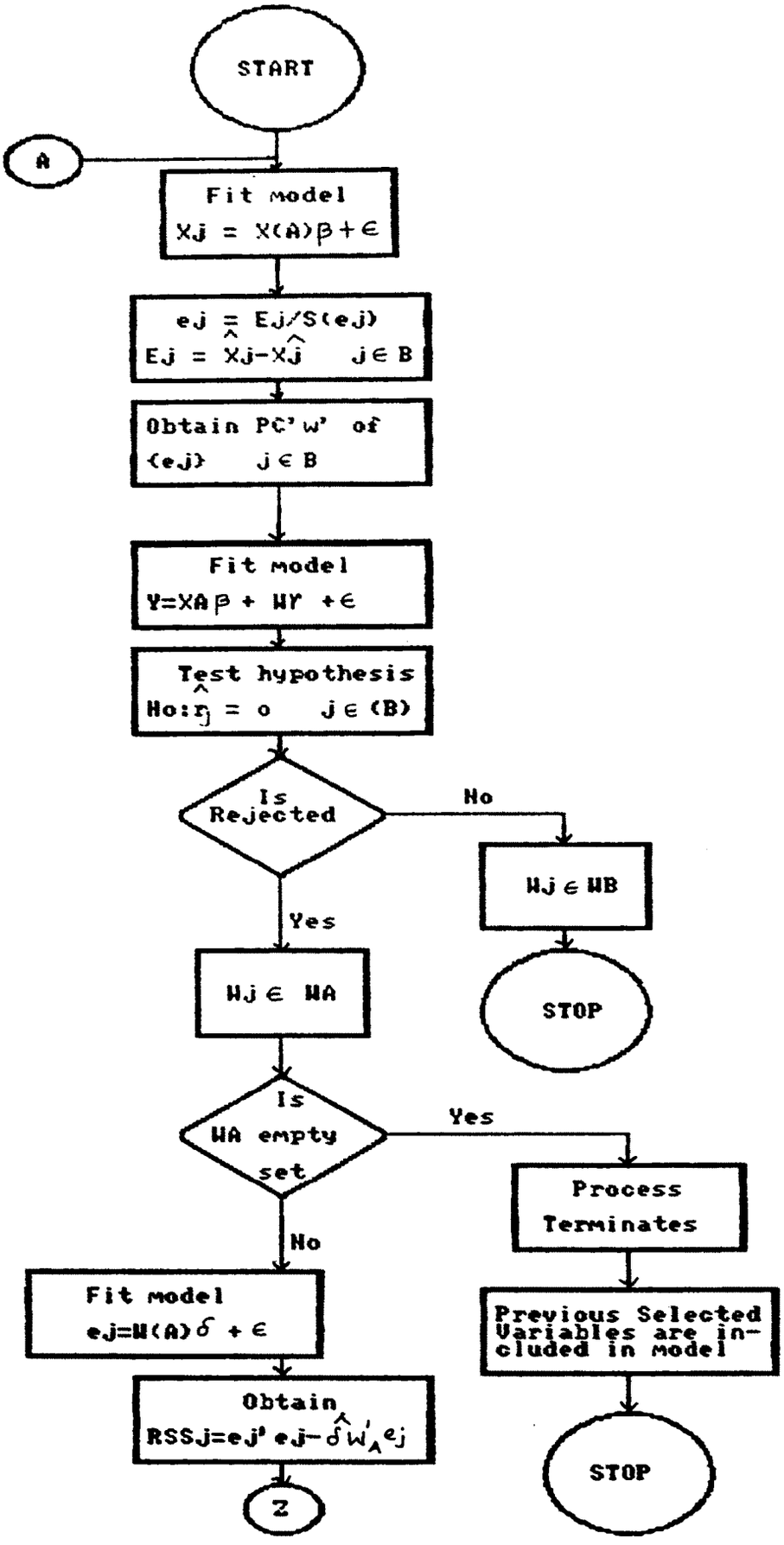
Appendix CB).

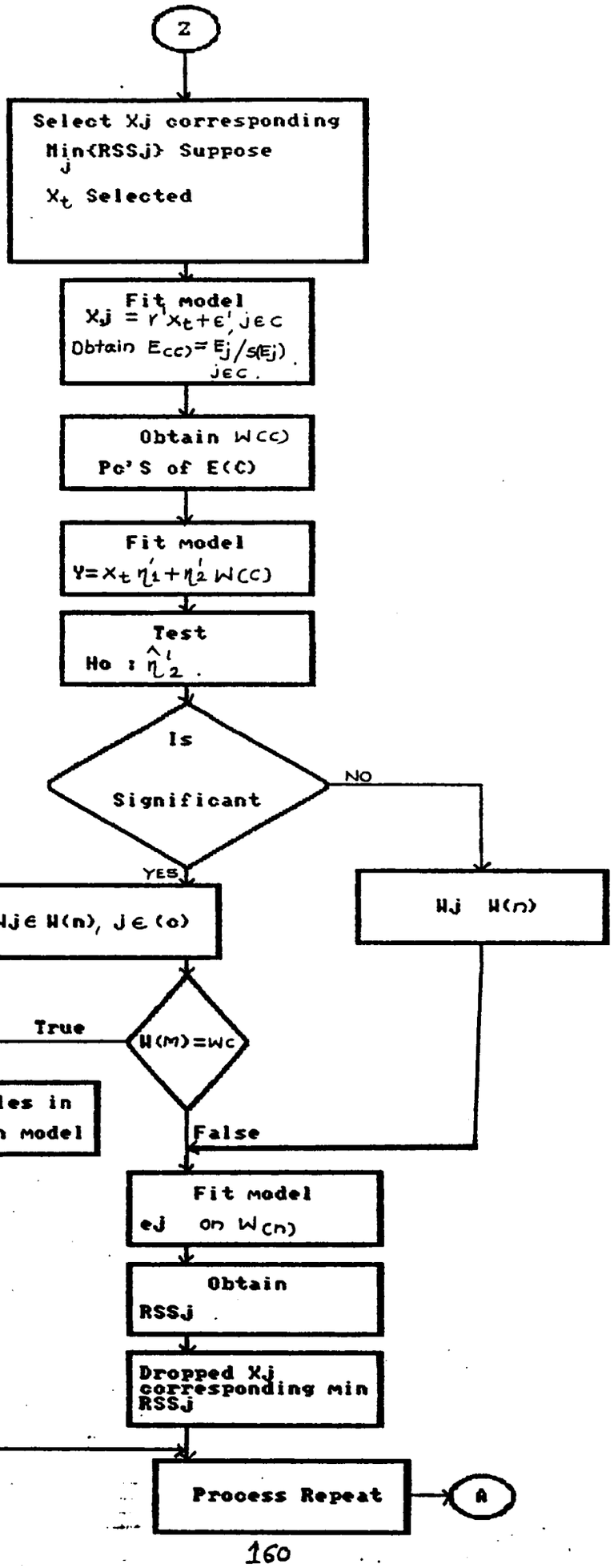

START
Fit Model
Xj = βXj + ∈
j = 2...p
Obtain
ej = Ej/S(Ej)
j=2..p
Obtain u = PC of
[e2,e3,...,ep]
Fit model
Y = βX1 + Σ δ'j Uj + ∈
Test hypothesis
Ho: δ'j=0 j=2,...,p
Reject
No
Yes
UjϵUB
Uj ϵ UA
STOP
UA=ϕ
Yes
No
Selected process terminates
Fit model
ej = u'A δ' + ∈'
Only X1 ils included in model
Obtain
RSSj = ej-ej
STOP
Select second variable corresponding to
Min RSSj
j
j = 2...p
Verify X1 is included or not in model

Appendix (C).


START
Fit model
X1 = β2 X2 + ∈*
Obtain
e* = ∈*/s(E*)
Fit model
y = θ + η1 x2 + η2 e* + ∈
n̂2 is Significant
No
Yes
X1 is dropped and also Future steps
X1 Stay in model
Process continue

Appendix (D).


START
A
Fit model
Xj = X(A)β+∈
ej = Ej/S(ej)
Ej = Xj-Xj^ j∈B
Obtain PC'w' of
(ej) j∈B
Fit model
Y=XAβ + WY +∈
Test hypothesis
Ho:γj = o j∈(B)
Is Rejected
No
Yes
Wj∈WB
STOP
Wj∈ WA
Is WA empty set
Yes
No
Process Terminates
Previous Selected Variables are included in model
STOP
Fit model
ej=W(A)δ +∈
Obtain
RSSj=ej' ej-δ^W'A ej
2


Z
Select Xj corresponding Min(RSSj) Suppose Xt Selected
Fit model Xj = r' Xt + ε' j∈C
Obtain E(C) = Ej / s(Ej) j∈C
Obtain W(C) Pc's of E(C)
Fit model Y = Xt η'1 + η'2 W(C)
Test Ho : η̂'2
Is Significant
NO
YES
Wj ∈ W(n), J ∈ (o)
Wj W(n)
W(M) = Wc
True
False
All variables in X(C) included in model
Fit model ej on W(n)
Obtain RSSj
Dropped Xj corresponding min RSSj
Process Repeat
A