SNOOP:
A COMPUTER PROGRAM
For 2- and 3-Dimensional Plotting

by Warren E. Frayer
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THE NEED
FOR SNOOPING

COMPUTER programs for two-dimensional (2D) plotting are numerous, and at least one is available in the library of most computer installations. However, in the process of model-building, researchers often want to examine graphed data for the presence of possible interactions of independent variables. This type of data "snooping" is common; but, to make use of available (canned) program decks, researchers must often resort to separating data into small sets and constructing and comparing several two-dimensional graphs.

To help with this chore, we have developed a computer program called SNOOP.

WHAT SNOOP WILL DO

Program SNOOP allows examination of interactions by extending two-dimensional (2D) graphing procedures to three-dimensional (3D) plotting. A variable hereafter referred to as a plotting character (PC) denotes the third dimension. The PC can assume values from 0 to 9 and is designated by the content of a selected card column in the observation data. The numeric characters that appear on the completed graph are the actual PC values that appear on the cards (a blank results in a PC value of 0).
For example, if volume, diameter, and height are measured on a group of felled trees, the 2D relationship of volume and diameter can be plotted on the same graph and up to 10 values (or classes) of the plotting character (height) can be distinguished. Examination of the graph may then result in selections of appropriate transformations, interaction terms, and/or weights to be applied in regression analysis. This procedure is not necessary for so simple a problem as postulated here, but extension of the possible uses of 3D plotting should be obvious. However, because of its simplicity, a volume-estimation problem is used as an example later.

Two-dimensional plotting is also available to the user of SNOOP. In this case the numeric characters that appear on the completed graph are frequencies of occurrence. The resulting character at any set of coordinates may then be blank (no occurrence), 1 to 9, or 0 (10 or more).

If overplots are attempted, messages (containing the coordinates and, in the case of 3D plotting, the PC values) are printed after the appropriate graph. An attempted overplot would occur when 2 or more observations have identical coordinates for 3D plotting, or 11 or more observations for 2D plotting.

When several dependent (Y) and independent (X) variables are included in one job, a set of fully labelled graphs is made, including each Y-X combination. And, for 3D, a separate set of graphs is made for each PC specified. The program automatically scales the graphs for each variable used. Other flexibility available to the user, barring certain properties given in the section Program Restrictions, can be summarized as follows:

2D and 3D jobs can be included in the same run in any order. As many jobs as desired may be included in a single run. Observation values can be negative, zero, and positive. Order of the variables on the observation cards is completely flexible.

PC's can be located anywhere on the observation cards. Multiple cards per observation can be used.
WHEN TO USE THE PROGRAM

The major use of program SNOOP is in the model-building stage of an estimation problem. A segment of data can be plotted in various ways, and the graphs can be examined for logical trends in dependent-variable values as responses to changes in the values of independent variables. Models can then be formed for regression analyses with the remaining data.

Consequently the value of the program is easily recognized when the researcher is attempting to explain previously unfamiliar functional relationships between many variables. With only a few variables, many observations, and expectations that limit the possibilities of functional-relationship alternatives, the researcher can go directly to the use of one of the canned regression routines—for example, Furnival\textsuperscript{1}—available at any large computer center.

HOW TO USE THE PROGRAM

The program is activated by a control deck supplied by the user. The control deck consists of cards containing the observations and information designating a specific manner in which the observations are to be handled by the program. The following instructions describe the complete control-deck setup (all underlined characters must be punched exactly as they appear in the instructions):

<table>
<thead>
<tr>
<th>Card group of cards</th>
<th>Card Title</th>
<th>Card columns</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Job</td>
<td>1-2</td>
<td>2D—For 2-dimensional plotting.</td>
</tr>
</tbody>
</table>

3D—For 3-dimensional plotting.

3-4 Number of Y's (NYS), right adjusted.

5-6 Number of X's (NXS), right adjusted (does not include PC variables).

7-8 Number of plotting characters (NPC), right adjusted. Use 00 (or blanks) for 2D.

9-11 Number of observations (NOBS), right adjusted.

12 Number of cards per observation (NCARDS).
   The use of 0 (or blank) will be interpreted as 1.

13-72 Alphameric job title to be printed above each graph.

<table>
<thead>
<tr>
<th>2</th>
<th>1</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>— There is no format continuation card.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>— The format specification is continued on the format continuation card.</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>— Left parenthesis.</td>
</tr>
<tr>
<td>3-72</td>
<td></td>
<td>— Up to 70 alphameric characters, ending with a right parenthesis, and containing a FORTRAN BCD format ( F )-specifications, which</td>
</tr>
</tbody>
</table>
describes the format of the \( Y \)'s and \( X \)'s on the observation cards. The right parenthesis is put on the format continuation card if column 1 of the format card = 2.

3 0 or 1 Format continuation 1-72 Continuation of the format specification described for columns 3-72 of the format card.

4 NYS + Variable labels 1 \( Y \)—If the variable is a dependent variable.
NXS  \( X \)—If the variable is an independent variable.

2 Blank.

3-52 Alphameric label (identifying information) associated with the variable.
This group of cards must be arranged in the order that the variables appear on the observation cards.

5 0 if 2D, NPC if 3D 3D plotting characters 1-18 \textit{PLOTTING} \textit{CHARACTER}

19 Blank.

20 Number of the card (of the observation set) on which the PC value is found. The use of 0 (or blank) will be interpreted as 1.

21-22 Column number (right-adjusted) in which the
PC value is found.

Blank.

24-31 Alphanemic label (identifying information) associated with the PC.

6 NOBS Observations 1-80 One or more cards for each observation as designated by the format cards.

xNCARDS

7 1 Job control 1-8 CONTINUE—If more than one job is included in the run. Card groups 1-7 are repeated after the job control card.

DONE (left adjusted) —Designates the end of the last job in the run.

An example of a control deck is shown in the appendix.

PROGRAM
RESTRICTIONS

Job restrictions applying both to 2D and 3D plotting are:

\[ \text{NYS} + \text{NXS} \leq 50 \]
\[ \text{NYS} \geq 1 \]
\[ \text{NXS} \geq 1 \]
\[ 2 \leq \text{NOBS} \leq 500 \]
\[ 1 \leq \text{NCARDS} \leq 9 \]

Job restrictions pertaining to 3D plotting only are:

\[ (\text{NYS} + \text{NXS} + \text{NPC}) \times \text{NOBS} \leq 10,000 \]
\[ 1 \leq \text{NPC} \leq 10 \]

A job restriction pertaining to 2D plotting only is:

\[ (\text{NYS} + \text{NXS}) \times \text{NOBS} \leq 10,000 \]
HOW TO USE THE RESULTS

For the researcher who is developing a regression model, the graphs produced by the program can be a valuable aid in selecting transformations, interaction terms, and variance-stabilizing weights, and in ordering of variables.

As an example, let us examine the sample control deck in Appendix I and the output in Appendix II.

The first page of output consists of summary information pertaining to the entire job. Card groups 1 to 5 of the control deck are printed as well as the values of all the variables in the first observation (the Y’s precede the X’s in the printout). Because the first job in this example specifies 3D plotting, the values of the plotting characters for the first observation are also included in the summary information.

Now, assume for the moment that expectations of functional relationships involving cubic-foot volume, diameter, and height are vague. The trees plotted in this example could be an initial sample of trees to be measured in the construction of a standard volume table; that is, we want to express cubic volume as a function of both diameter and height, if possible. Consequently, the control deck has been set up to plot a 3D graph of cubic-foot volume as a function of diameter, using 10-foot height class as a plotting character.

The resultant graph shows that volume increases with an increase in diameter, and there is an increase in the slope of the relationship as diameter increases.

Free-hand curves as they would be drawn on the graph for several groups of the 10-foot height classes are shown in figure 1. These can be represented in three dimensions as in figure 2.

Upon close examination — by methods described by Jensen\(^\text{a}\) — figure 2 suggests that, for a given height, volume is a function of the square of diameter. Also, for a given diameter, volume

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appears to be a linear function of height. Thus, the interaction term of \[(\text{diameter})^2 \times \text{height}\] would be an appropriate independent variable for regression analysis. The user might also study the graph further to determine a weighting procedure to stabilize the variance of volume as \[(\text{diameter})^2 \times \text{height}\] varies.

Following the graph is the printed list of attempted overplots, including their coordinates and PC values. Following the overplots, the printed message CONTINUE signifies that the program is continuing to the next job in the run.

The second job is simply a demonstration of 2D graphing. The same observations were used as in the first job. Two graphs were specified by designating volume as a dependent variable.
and diameter and height as independent variables. The reader will note that the numbers printed in the resultant graphs are frequencies of occurrence. There are no overplots, and the printed message DONE signifies that the last job has been run.

**INFORMATION FOR PROGRAMMERS**

Program SNOOP was thoroughly tested and is operational on an IBM 7040 computer with the IBSYS monitor. The program is written in FORTRAN IV and should run with little or no modification on other computers that accept FORTRAN IV, have a 32K core, and have three tape drives or equivalent input/output devices. The logical tape assignments are:
Unit Use
5 Control-deck input
6 Program output
9 Intermediate operations (scratch tape)

A special subroutine was necessary for backspacing logical unit 5 at the computer installation where this program was developed. A simple BACKSPACE 5 command or its equivalent is all that is necessary at other installations. The two places in the program where this must be done are marked with comments. A general flow diagram of the program is shown in figure 3. And a listing of the program is presented in appendix III.

ERROR MESSAGES

When the user makes an error in preparing the control deck, the program will print a message if the error is such that execution of the program would be illogical or impossible. The program then continues to scan the control deck for additional jobs. The error messages used by the program are:

NYS = XX
NYS MUST BE GREATER THAN 0 AND LESS THAN 50

NXS = XX
NXS MUST BE GREATER THAN 0 AND LESS THAN 50

NPC = XX
NPC MUST BE BLANK OR 0

NPC = XX
NPC MUST BE GREATER THAN 0 AND LESS THAN 11

NOBS = XXX
NOBS MUST BE GREATER THAN 1 AND LESS THAN 501

10
Figure 3.—SNOOP flow chart.
(NYS + NXS) X NOBS = XXXXXX
THIS MUST BE EQUAL TO OR LESS THAN 10,000

(NYS + NXS + NPC) X NOBS = XXXXXX
THIS MUST BE EQUAL TO OR LESS THAN 10,000

THE FOLLOWING CONTROL CARD IS MISPUNCHED OR OUT OF ORDER . .
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

THERE IS A VARIABLE LABEL WITH THE 3D PLOTTING CHARACTER GROUP

THERE IS A NON-NUMERIC CHARACTER IN OBSERVATION XXX FOR PLOTTING CHARACTER XX

After any of the above messages are printed, the following message is printed:
UNABLE TO PROCESS THIS JOB
THE PROGRAM IS NOW SEARCHING FOR THE NEXT JOB (IF ANY)
## APPENDIX

### I

**CONTROL-DECK EXAMPLE**

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
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<td><strong>CUBIC-FOOT VOLUME</strong></td>
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<td>62</td>
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<tr>
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<td>72</td>
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</table>

**CONTINUE**

200102003.14TH PINE Data - Examples of Two-Dimensional Plotting

15 (x5, x6.1, x8, 5.9, 1x, 6.9 4.11)

x = DIAMETER AT BREAST HEIGHT
X = TRUNK HEIGHT
Y = CUBIC-FOOT VOLUME

(SAME OBSERVATION DECK AS USED FOR THE FIRST JOB MUST BE INSERTED HERE)

DONE
## II

### OUTPUT FOR CONTROL DECK GIVEN IN I.

<table>
<thead>
<tr>
<th>Table</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Value 1</td>
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<tr>
<td>Column 2</td>
<td>Value 2</td>
</tr>
<tr>
<td>Column 3</td>
<td>Value 3</td>
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### Table Contents

- Column 1
- Column 2
- Column 3

### Footnote

Continued

15
### Output for Control Deck — Continued

<table>
<thead>
<tr>
<th>Job Number</th>
<th>Job Title</th>
<th>Description</th>
<th>Examples of Two-Dimensional Plotting</th>
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</thead>
<tbody>
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<td>TEST 00146</td>
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**Note:**

> The data in the table above is for demonstration purposes only. The actual data values may differ. Please consult the relevant documentation for accurate information.
III
LISTING OF PROGRAM SNOOP.

DIMENSION FMT(36), LABEL(50,50), (LABEL(50,50), GONLAB(10,2), TITLE(151), (VAR(50), CHECK(5), IPC(10), XM(10), PC(10), XIS(10), VV1501, VV1501, VPC(120), A120), IGRAPH(50,100), KABS(15), KGEN(15))

C
C READ THE CONTROL DECK AND CHECK FOR ERRORS
C
C C READ THE JOB DESCRIPTION CARD
C JOB=0
799   JOB=JOB+1
READ(7000) DEM, NYS, NPC, NOBS, NCARDS, TITLE(1), TITLE(1), TITLE(1)
700   FORMAT(3I32, 10A4)  NC=NCARDS
       IF (NCARDS.EQ.0) NC=1
       IF (NCARDS.EQ.0) NC=NCARDS=0
       WRITE (6, 7511) JOB
       WRITE (6, 7511) TITLE(1), TITLE(1)
       WRITE (6, 7521) DEM
       WRITE (6, 7531) NYS
       WRITE (6, 7541) NPC
       WRITE (6, 7551) NOBS
       WRITE (6, 7561) JOB

10001 FORMAT(3H NUMBER OF CARDS PER OBSERVATION = )
       WRITE (6, 7561) NPC
       WRITE (6, 7571)

7501 FORMAT(10H JOB NUMBER = )

7511 FORMAT(2H JOB TITLE = )

7521 FORMAT(1H A2, 4H PLOTTING )

7531 FORMAT(35H NUMBER OF DEPENDENT(Y) VARIABLES = )

7541 FORMAT(35H NUMBER OF INDEPENDENT(X) VARIABLES = )

7551 FORMAT(25H NUMBER OF OBSERVATIONS = )

7561 FORMAT(35H NUMBER OF PLOTTING CHARACTERS = )

7571 FORMAT(1H THE CONTROL DECK FOR THIS JOB IS........
DATA THREE /2M30/
DATA TM0/2M20/
IF(DM.NE.3) AND (DM.NE.10) GO TO 999
IF(NYS.LT.0 OR NYS.GE.500) GO TO 800
IF(NPC.LT.0 OR NPC.GE.500) GO TO 901
IF(NOBS.NE.2 OR NOBS.GE.500) GO TO 810
IF(DM.EQ.3) GO TO 702
IF(NPC.LT.0) GO TO 82
IF((NYS+NPCS).GE.10000) GO TO 703, 860
702 IF(NPC.LT.0) AND NPC.GT.1000 GO TO 810
IF((NYS+NPCS).NE.10000) GO TO 703, 861
703 WRITE (6, 7041) DEM, NYS, NPC, NOBS, NCARDS, TITLE(1), TITLE(1), TITLE(1)
704 FORMAT(1H JOB, 3I32, 10A4)
C C READ THE VARIABLE LABELS
C READ THE FORMAT CARDS
READ(5, 7801) FORM(FMT(1), TITLE(1), TITLE(1))
780 FORMAT(1I17A4, A3)
IF (FORM(1).EQ.1) GO TO 999
WRITE (6, 7811) FORM(FMT(1), TITLE(1), TITLE(1))
781 FORMAT(1I17A4, A3)
IF (FORM(1).EQ.1) GO TO 706
READ (5, 7051) FMT(1), TITLE(1), TITLE(1)
705 FORMAT (1H4A4)
WRITE (6, 7051) FMT(1), TITLE(1), TITLE(1)
C C READ THE VARIABLE LABELS
C XVAR=NYS+NXS
C
LISTING OF PROGRAM SNOOP. — CONTINUED.

```
1XX=0
1YY=0
DO 740 I=1,50
740 IVA(1)=0
DO 707 I=1,NVAR
READ(5,TORI)VAR(LABEL(I),K=1,50)
708 FORMAT(A,1X,5D11)
DATA YV1/YV/
DATA XX/XX/
IF(1VAR.NE.YV.AND.VAR.NE.XX)GO TO 999
IF(1VAR.EQ.XX)GO TO 709
1YY=YV=1
1YV(I)YV
GO TO 710
709 IXX=IXX+1
1IY(I)=IXX+NYS
710 WRITE(6,791)VAR,LABEL(I),K=1,50)
711 FORMAT(H A1.1X.5D11)
C ORDER THE VARIABLE LABELS
KKK=1VAR(I)
DO 711 K=1,50
711 ILABEL(K),K=LABEL(I),K
707 CONTINUE
C READ THE PLOTTING CHARACTERS LABELS
IFIDEM.EQ.TMODIDO TO 751
DO 750 I=1,NPC
READ(5,T12)CHEK(I),J=1,5),ICARD,IPC(I),ICLNL(1),K=1,2)
712 FORMAT(A2.4A,1X,J,1,12,1,12,2A4)
IF(1CHEK(I),NE.,K,OR.CHEK(I).NE.XX)GO TO 830
DATA T1,T2,T3,T4,T5/2HP,1426,6H/26HM,5H,4NC/8NC.
INE,T4,OR.CHEK(I).NE.T51GO TO 999
IF(1IP(I),NE.,D,OR,IP(I).GE,ROGD TO 999
WRITE(6,792)CHEK(I),J=1,5),ICARD,IPC(I),ICLNL(1),K=1,2)
792 FORMAT(A2,4A,2A,12,1,12,2A4)
IC=ICARD
IF(1CHEK(I)=C1
ICT(I)=(IC-1)*80)+IPC(I)
750 CONTINUE
751 CONTINUE
C THE OBSERVATIONS ARE NOW PLACED IN A VECTOR CALLED XMAT
C
797 FORMAT(6,797)
...OBSERVATION CARDS ARE LOCATED HERE....
DO 100 K=1,50
100 VK(K)=0.0
DO 110 K=1,1020
110 XMAT(K)=0.0
ICOUNT=0
C READ THE VARIABLES
103 READ(5,FMT1)VAR(K),K=1,NVAR
ICOUNT=ICOUNT+1
IFIDEM.NE.TMODIDO TO 13
DO 9691 JK=1,NC
C THE FOLLOWING CALL STATEMENT IS USED TO BACKSPACE THE INPUT UNIT
CALL I0EDIT(1)
```

Continued
CONTINUE
C READ THE PLOTTING CHARACTERS
KSTART=1
KEND=80
DO 971 IJKL=1,NC
READ(15,112)(KPC(K),K=KSTART,KEND)
KSTART=KSTART+80
9692 KEND=KEND+80
112 FORMAT(BOA1)
DO 113 I=1,NPC
KPC=PC(I)
IF(KPC.EQ.1)GO TO 960
PC(I)=KPC
113 CONTINUE
GO TO 895
960 CONTINUE
GO TO 1013
10013 WRITE(6,970)
970 FORMAT(999) THE PLOTTING CHARACTERS FOR THIS OBSERVATION ARE... )
DO 972 I=1,NPC
L=PC(I)
972 WRITE(6,971)L
971 FORMAT(4H PC(I2.2H)=I(2))
GO TO 795
C ORDER THE VARIABLES
13 DO 200 ISkip=1,NVAR
IP=I+1
200 FORMAT(4H I(Skip))
GO TO 795
WRITE(6,799)
799 FORMAT(999) VARIABLES IN THE FIRST OBSERVATION ARE... )
DO 650 I=1,NYS
650 WRITE(6,651) I
651 FORMAT(3H Y(I2.2H)=E(14.8))
DO 652 E=1,NKS
652 WRITE(6,653)I,E
653 FORMAT(4H KS(I2.2H)=E(14.8))
IF(D.EQ.THREE) GO TO 10013
C STORE THE VARIABLES
795 KK=0
DO 410 K=1,NVAR
KK=KK+1
410 IF(K.EQ.1) WRITE(3,KK)
KMAX=1
XMAX=KMAX
C STORE THE MAXIMUM AND MINIMUM VALUES
420 IF(I.AGE.3) GO TO 107
AMAX=3.0
AP=3.0
100 CONTINUE
107 AMAX=VV(K)
XMAX(AMAX+1)=AMAX
CONTINUED
20
LISTING OF PROGRAM SNOOP. — CONTINUED.

108 AIN=VPN(I)
XMAT(KMIN)+=AIN

410 CONTINUE

C STORE THE PLOTTING CHARACTERS
IFIDEM,NE,THREEIDIG TO 500
DO 401 L=1,NPC
KSLF=(NDS+2)*(INVAR+L-1)+1COUN
401 XMAT(KSLF)=PC(L)
500 IFICOUNT.NE.NOBS1GO TO 103

C
C THE VALUES IN XMAT ARE CHANGED TO ROW AND COLUMN NUMBERS FOR THE
C OUTPUT MATRIX(IGRAPH)
C
K=1
DO 1050 K=1,NVAR
ML=(K-1)*NOBS+KX
MX=(NOBS*K+KX-1)
KK=KK+2
DO 1050 KX=ML,ML
IF(K.XEQ.0)GO TO 1010
DIV=50.
GO TO 1011
1010 DIV=100.
1011 XINC=(XMAT(ML+2)-XMAT(ML+1))/DIV
XINC=0.
1007 IF(LX1G.EQ.0)GO TO 1006
A=XMAT(ML+1)
RXMAT=0.
1006 IF(LX1G.EQ.0)GO TO 1007
A=XMAT(ML+1)
RXMAT=RXMAT+1.
GO TO 1007
1007 XMAT(LX)=RXMAT
MX=RXMAT+1.
GO TO 1050
1020 IF(LX1G.EQ.0)GO TO 1050
XMAT(LX)+=100.
GO TO 1050
800 WRITE(6,990)NYS
GO TO 1000
801 WRITE(6,991)NYS
GO TO 1000
802 WRITE(6,992)NPC
GO TO 1000
803 WRITE(6,993)NPC
GO TO 1000
810 WRITE(6,994)NOBS
GO TO 1000
830 WRITE(6,995)
GO TO 1000
835 WRITE(6,996)ICOUNT+1
GO TO 1000
860 NOVER=(NYS*NYS+NPC)*NOBS
WRITE(6,997)NOVER
GO TO 1000
861 NOVER=(NYS*NYS+NPC+NOBS)
WRITE(16,998)OVER
GO TO 1000
C THE FOLLOWING CALL STATEMENT IS USED TO BACKSPACE THE INPUT UNIT

999 CALL I0ED(IN)
READ(5,892)(R(I),I=1,20)
WRITE(6,889)
WRITE(6,888)
GO TO 1000

990 FORMAT(5H0,3X,NYS=12,44H NYS MUST BE GREATER THAN 0 AND LESS THAN 30)
991 FORMAT(5H0,3X,NXS=12,44H NXS MUST BE GREATER THAN 0 AND LESS THAN 50)
992 FORMAT(5H0,3X,NPC=12,44H NPC MUST BE BLANK OR 0)
993 FORMAT(5H0,3X,NPC=12,44H NPC MUST BE GREATER THAN 0 AND LESS THAN 10)
994 FORMAT(5H0,3X,NOB5=13,46H NOBS MUST BE GREATER THAN 1 AND LESS THAN 5)
995 FORMAT(6H0,3X,NOB5=13,46H NOBS MUST BE GREATER THAN 1 AND LESS THAN 5)
996 FORMAT(6H0,3X,NOB5=13,46H NOBS MUST BE GREATER THAN 1 AND LESS THAN 5)
997 FORMAT(1H0,NYS=NXS+16,42H THIS MUST BE EQUAL TO OR LESS THAN 10,000)
998 FORMAT(2H0,NYS+NPC+16,42H THIS MUST BE EQUAL TO OR LESS THAN 10,000)
891 FORMAT(6H0,3X,FOLLOWING CONTROL CARD IS MISPLACED OR OUT OF ORDER)
892 FORMAT(20A4)
893 FORMAT(11,20A4)
1000 WRITE(6,1001)
1001 FORMAT(2H0,NOMBRE TO PROCESS THIS JOB/55H THE PROGRAM IS NOW SEARCHING FOR THE NEXT JOB/TIF ANY)
1002 READ(5,1003)NRL
1003 FORMAT(4A4)
DATA EECCEEDONE,ANDDONE,ANDDONE?
IFITAL.EQ.EE10G IGO TO 2000
IFITAL.EQ.EE10G TO 799
GO TO 1002

1050 CONTINUE
C
C CONSTRUCT THE GRAPHS (GRAPH)
C
C
IF(DEM.EQ.TWOD)NPC=1.
DO 2010 J=1,NPC
DO 2010 K=1,NYS
KX=(2*K-1)+1
KY=(2*NYS)+1
LNY5=NYS+1
DO 2010 L=LNY5,NVAR
REWIND 9
DO 2030 I=1,50
DO 2030 M=1,100
2030 GRAPH1,M=100
MT=(K-1)*NOBS+KX
MK=(L-1)*NOBS+KY
MK=MK+NOBS-1
KY=KY+2
IE1NT=0
IY=1MAT(MT)+001

CONTINUED
LISTING OF PROGRAM SNOOP — CONTINUED.

```
IX=KMAT(IK)+100
IF(IX.EQ.1001) GO TO 3000
IF(IX.EQ.1006) GO TO 3000
IF(IX.EQ.1010) GO TO 3000
GO TO 3011
3000 WRITE(9,3002) IY,IX
3002 FORMAT(2I3)
IX=IX+1
GO TO 3011
3011 CNT=1
CALL NORM2(IY,IX)
IF(LNORM.EQ.1) GO TO 3013
IF(LNORM.EQ.2) GO TO 3013
IF(LNORM.EQ.3) GO TO 3013
IF(LNORM.EQ.4) GO TO 3013
GO TO 3013
3013 FORMAT(3I3)
GO TO 3011
3041 FORMAT(2I3)
GO TO 3044
3044 CONTINUE
3051 FORMAT(I0)
CONTINUE
3055 FORMAT(I0)
CONTINUE
3059 CONTINUE
3063 CONTINUE
3067 CONTINUE
3071 WRITE(6,3070) BEGIN
```

CONTINUED

23
LISTING OF PROGRAM SNOOP. — CONTINUED.

3070 FORMAT(i4, e11.5, 102x)
3080 FORMAT(i15x, i1x, i1x, i1x, i1x, i1x, i1x, i1x, i1x, i1x)
3090 FORMAT(i15x, 2x, i1x, i1x, i1x, i1x, i1x)
3092 FORMMAT(3h, y=ei1.5, 3x, 2x=ei1.5, 3x, 3hpc=12)

C PRINT THE OVERPLOTS
DO 3085 i=1,10

READ(9,4040)Y,I

4040 FORMAT(2i13)
Y=iy
Y=(BEGIN+(Y+YINC))
XI=IX
XI=(BEGIN+(X+XINC))
WRITE(6,3090)Y,I
GO TO 3085
3090 READ(4,4041)Y,I,KPLOT

4041 FORMAT(3i13)
Y=iy
Y=(BEGIN+(Y+YINC))
XI=IX
XI=(BEGIN+(X+XINC))
WRITE(6,3092)Y,I,KPLOT
GO TO 3085
3092 FORMAT(3h, y=ei1.5, 3x, 2x=ei1.5, 3x, 3hpc=12)
3085 CONTINUE
3090 CONTINUE

READ(9,3020)TAIL,TAI
IF(TAIL#.EQ.0)AND.TAIL#.CC100 TO 999
3020 FORMAT(1A4)
WRITE(6,3021)TAIL,TAI
3021 FORMAT(1H2A4)
IF(TAIL#.EQ.CC100 TO 799
2000 CONTINUE
STOP
END
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