```
C  MGCA
C
C  PER CAMBIARE LA PRIMA DIMENSIONE DELLA MATRICE CONTENENTE I DATI
C  INIZIALI E' NECESSARIO OPERARE SUL DIMENSIONAMENTO DI ALCUNE MATRICI
C  DEFINITE NELLE SUBROUTINE CHERN, VDCHER, PLCHER, ANDR, CORR E TRAS,
C  CUI SI RIMANDA PER ISTRUZIONI DETTAGLIATE.
C  OCCORRE INOLTRE IN QUESTO PROGRAMMA SOSTITUIRE LA PRIMA DIMENSIONE
C  DELLE MATRICI DATI E D, E QUELLA DEL VETTORE Y, CON IL
C  VALORE DESIDERATO
C
      INTEGER XV1,YV1
      REAL LX,LY
C
      LOGICAL*1 FOR1(80),FOR2(80)
      DIMENSION DAT1(100,20),X(100),VALFU(100)
      COMMON /CVPL1/D(100,20),XFACE(202),YFACE(202),NFACE,
     *       XNOSE(6),YNOSE(6),XMOUTH(53),YMOUTH(53),NMOUTH,XLEYE(83),
     *       XREYE(83),YEYES(83),NEYES,XLBROW(2),XRBROW(2),YBROWS(2),
     *       EARX,EARY,REAR,PUPILX(2),PUPILY(2),RPUP
      COMMON /CFACCE/FDATA(20),NVU,AI(20),BI(20),
     *       Y(100),FEAT(20,2),IRAND(20),IADV(20),IAFV(20),
     *       IVNO(20),DEFAUL(20)
      COMMON /CV12/SX,SY
      COMMON /CPL1/PX,PY
      COMMON /CPL2/SCX,SCY,FAC,LX,LY,SCY1
C
C
      DATA IAFV/20*0/,Y/100*0.0/,IRAND/20*1/,
     *     IVNO/20*0/,IADV/20*0/,
     *     FEAT/.2,.35,.5,.5,.5,.15,.2,-4.,.3,.0,.3,.2,
     *          .4,.2,.2,.6,.0,.3,.1,.1,.7,.65,1.,1.,1.,
     *          .4,.8,4.,1.,.3,.8,.6,.8,1.,.8,1.,1.,1.,
     *          1.,.2/,
     *     DEFAUL/.6,.5,.5,1.,1.,.2,.5,.1,.5,.1,.7,.5,.6,
     *            .5,.5,.8,.5,.5,.5,.1/
C
C*********************************************************************
C  LETTURA DEL FORMATO DEI DATI IN INPUT E IN OUTPUT.
C*********************************************************************
C
      READ(2,10) (FOR1(I),I=1,80),(FOR2(I),I=1,80)
   10 FORMAT(80A1)
C*********************************************************************
C  LETTURA DELLE DIMENSIONI DELLA MATRICE DEI DATI E DEI DATI STESSI
C  (NPLOTS = NUMERO DI INDIVIDUI
C   NVREAD = NUMERO DI VARIABILI)
C*********************************************************************
C
      READ(2,15) NPLOTS,NVREAD,NRCOL
   15 FORMAT(3I4)
      IF(NRCOL) 16,16,17
   16 READ(2,FOR1) ((D(I,J),J=1,NVREAD),I=1,NPLOTS)
      GOTO 18
   17 READ(2,FOR1) ((D(I,J),I=1,NPLOTS),J=1,NVREAD)
```

```
C
   18 WRITE(4,20) (FOR1(I),I=1,80),(FOR2(J),J=1,80)
   20 FORMAT(2X,'***   FORMATO DI INPUT:  ',80A1,//,
     *2X,'***   FORMATO DI OUTPUT:  ',80A1)
C
      WRITE(4,30) NPLOTS,NVREAD
   30 FORMAT(/,2X,'***  N. DI INDIVIDUI  :',I4,
     *//,8X,'N. DI VARIABILI:  ',I4)
C
      WRITE(4,FOR2) ((D(I,J),J=1,NVREAD),I=1,NPLOTS)
C
C*************************************************************************
C  APERTURA SEDUTA INTERATTIVA
C*************************************************************************
C
      CALL INIT(9600,4010,2)
      CALL ERASE
C
      WRITE(5,40)
   40 FORMAT(6X,'SISTEMA PER LA RAPPRESENTAZIONE GRAFICA',/7X,
     *          'DI DATI MULTIVARIATI SECONDO I METODI'/2X,
     * 'DELLE FACCE DI CHERNOFF E DELLE CURVE DI ANDREWS',//19X,
     * '**********',///)
C
   45 WRITE(5,50)
   50 FORMAT(//2X,'OPZIONI:   1  FACCE DI CHERNOFF',/13X,
     *                        '2  CURVE DI ANDREWS'//)
C
      READ(5,60)KFACU
   60 FORMAT(I1)
C
      WRITE(4,50)
      WRITE(4,70) KFACU
   70 FORMAT(/,2X,'***   METODO  ',I2)
C
   75 WRITE(5,80)
   80 FORMAT(2X,'OPZIONI:   1  VIDEO',//13X,'2  PLOTTER'///2X)
C
      READ(5,85)KVIPL
   85 FORMAT(I1)
   90 IJ=1
  100 IF(KFACU.EQ.2) GO TO 500
      CALL CHERN(IJ,NPLOTS,NVREAD,DATI)
      IF(KVIPL.EQ.2) GO TO 200
      CALL VDCHER(IJ,NPLOTS,ISW)
  150 IF(IJ.EQ.NPLOTS) GO TO 1000
      IJ=IJ+1
      GO TO 100
  200 CALL PLCHER(IJ)
      GO TO 150
  500 CALL ANDR(NPLOTS,NVREAD,NVAR,D,IJ,VMIN,VMAX,X,VALFU,NP,DATI)
C
      IF(KVIPL.EQ.2) GO TO 600
      CALL VDANDR(IJ,NPLOTS,VMIN,VMAX,X,VALFU,NP,KP)
```

```
C
C
      GO TO 150
  600 CALL PLANOR(IJ,VMIN,VMAX,X,VALFU,NP,NPAG,KP)
      GO TO 150
  700 KVIPL=2
      GO TO 90
C
 1000 CALL ERASE
      WRITE(5,1050)
      WRITE(4,1050)
 1050 FORMAT(/2X,'INTRODURRE:   1 - DISEGNO SU PLOTTER',//,
     *16X,'2 - MODIFICA DELLE ASSOCIAZIONI TRA ',//,
     *20X,'PARAMETRI E VARIABILI (FACCE DI CHERNOFF)',//,
     *16X,'3 - USO DI VARIABILI DIVERSE (CURVE DI ANDREWS)',//,
     *16X,'4 - SCELTA DEL METODO',//,
     *16X,'5 - STOP',//)
C
      READ(5,1100) ICHOIC
 1100 FORMAT(I1)
      WRITE(4,1110) ICHOIC
 1110 FORMAT(/,2X,'***   OPZIONE  ',I1)
C
      GO TO(700,75,75,45,2000),ICHOIC
C
 2000 CALL FINIT
      STOP
      END
```

```
      SUBROUTINE CHERN(IJ,NPLOTS,NVREAD,DATI)
C
C  PER LA MODIFICA DESCRITTA IN MGCA, OCCORRE SOSTITUIRE LA PRIMA
C  DIMENSIONE DELLE MATRICI DATI E D, E QUELLA DEL VETTORE Y, CON
C  IL VALORE DESIDERATO
C
      DIMENSION DATI(100,20)
C
      COMMON /CVPL1/D(100,20),XFACE(202),YFACE(202),NFACE,
     *       XNOSE(6),YNOSE(6),XMOUTH(53),YMOUTH(53),NMOUTH,XLEYE(83),
     *       XREYE(83),YEYES(83),NEYES,XLBROW(2),XRBROW(2),YBROWS(2),
     *       EARX,EARY,REAR,PUPILX(2),PUPILY(2),RPUP
      COMMON /CFACCE/FDATA(20),NVU,AI(20),BI(20),
     *       Y(100),FEAT(20,2),IRAND(20),IADV(20),IAFV(20),
     *       IVNO(20),DEFAUL(20)
C
C
      DIMENSION YSAME(202),ABC(22),XYZ(22),VRAN(20,2),
     *          IVAR(2),PARNUM(160)
      REAL L,LSQ,LB,MINY(20),MAXY(20),LHSRHS(202)
C
      DATA CAPH/4.0/
      DATA NU,NL,NNOSE,NMOUTH,NEYES,NBROWS/100,100,4,51,80,2/
      DATA PARNUM/'LARG','HEZZ','A FA','CCIA','    ','    ','    ',
     *     '    ','POSI','ZION','E OR','ECCH','ID  ','    ','    ',
     *     '    ','ALTE','ZZA ','META','''' FA','CCIA','    ','    ',
     *     '    ','ECCE','NTRI','CITA','''' CO','NTOR','NO S','UPER',
     *     'IORE','ECCE','NTRI','CITA','''' CO','NTOR','NO I','NFER',
     *     'IORE','LUNG','HEZZ','A NA','SO  ','    ','    ','    ',
     *     '    ','ALTE','ZZA ','CENT','RO B','OCCA','    ','    ',
     *     '    ','CURV','ATUR','A BO','CCA ','    ','    ','    ',
     *     '    ','LUNG','HEZZ','A BO','CCA ','    ','    ','    ',
     *     '    ','ALTE','ZZA ','CENT','RO O','CCHI','    ','    ',
     *     '    ','SEPA','RAZI','ONE ','OCCH','I   ','    ','    ',
     *     '    ','INCL','INAZ','IONE',' OCC','HI  ','    ','    ',
     *     '    ','ECCE','NTRI','CITA','''' OC','CHI ','    ','    ',
     *     '    ','LUNG','HEZZ','A OC','CHI ','    ','    ','    ',
     *     '    ','POSI','ZION','E PU','PILL','E   ','    ','    ',
     *     '    ','ALTE','ZZA ','SUPR','ACCI','GLIA','    ','    ',
     *     '    ','ANGO','LO S','OPRA','CCIG','LIA ','    ','    ',
     *     '    ','LUNG','HEZZ','A SO','PRAC','CIGL','IA  ','    ',
     *     '    ','RAGG','IO O','RECC','HIO ','    ','    ','    ',
     *     '    ','LARG','HEZZ','A NA','SO  ','    ','    ','    ',
     *     '    '/
C
      IF(IJ.GT.1) GO TO 130
      NFACE=NU+NL
C
C  INTRODUZONE INTERATTIVA DEI PARAMETRI NECESSARI AL CALCOLO
C
   10 WRITE(5,20)
   20 FORMAT(//'$ N. DI VARIABILI DA INCLUDERE: ')
      READ(5,25) NVU
   25 FORMAT(I2)
```

```
      WRITE(4,27) NVU
   27 FORMAT(/,2X'***   N. DI VARIABILI DA INCLUDERE:  ',I2)
      IF(NVU.LE.NVREAD) GOTO 30
      WRITE(5,28)
   28 FORMAT(/,2X,'ATTENZIONE: IL N. INTRODOTTO E'' MAGGIORE DEL',/,
     *2X,'N. DI VARIABILI. INTRODURRE IL VALORE CORRETTO.',/)
      GOTO 10
   30 WRITE(5,35)
      WRITE (4,35)
   35 FORMAT(//2X,'ASSOCIAZIONE TRA I PARAMETRI DELLA FACCIA E LE
     *VARIABILI',/,2X,'(INTRODURRE 0 SE SI VUOLE
     *ASSUMERE IL VALORE DI DEFAULT)'//)
C
   36 K5=0
      DO 50 I=1,20
      K=8*(I-1)+1
      K1=K+7
   38 WRITE(5,40) I,(PARNOM(M),M=K,K1)
   40 FORMAT('S',I2,4X,8A4,4X)
      READ(5,41) IVN
   41 FORMAT(I2)
      WRITE(4,42) I,(PARNOM(M),M=K,K1),IVN
   42 FORMAT(/,2X,I2,4X,8A4,4X,I2)
      IF(IVN.EQ.0) GOTO 50
      IF(IVN.LE.NVREAD) GOTO 45
      WRITE(5,43)
   43 FORMAT(/,2X,'ATTENZIONE: L'' ULTIMO VALORE INTRODOTTO SUPERA '/
     *2X,'IL N. DI VARIABILI. INTRODURRE IL VALORE CORRETTO.',/)
      GOTO 38
   45 K5=K5+1
      IAFV(K5)=I
      IVNO(K5)=IVN
      IF(K5.EQ.NVU) GOTO 55
   50 CONTINUE
C
   55 IF(K5.EQ.NVU) GO TO 56
C
      WRITE(5,44) K5,NVU
   44 FORMAT(/2X,'ATTENZIONE: SONO STATE USATE SOLO',I4,2X,
     *'VARIABILI,',/2X,'ANZICHE'' ',I4,2X,'COME PRECEDENTEMENTE
     * INDICATO.',/2X,'L'' ASSEGNAZIONE RIPRENDE DALL'' INIZIO.',/)
      GO TO 36
C
   56 DO 65 J=1,NVU
      DO 60 I=1,NPLOTS
      DATI(I,J)=D(I,IVNO(J))
C
   60 Y(I)=DATI(I,J)
      CALL RANGE(NPLOTS,Y,YMIN,YMAX)
      VRAN(J,1)=YMIN
      VRAN(J,2)=YMAX
   65 CONTINUE
   70 DO 80 I=1,20
   80 FDATA(I)=DEFAUL(I)
```

```
      DO 110 I=1,NVU
      JJ=IAFV(I)
      IF (JJ.EQ.0) GO TO 110
      RANF1=FEAT(JJ,1)
      RANF2=FEAT(JJ,2)
      BI(JJ)=(RANF2-RANF1)/(VRAN(I,2)-VRAN(I,1))
      AI(JJ)=RANF1-VRAN(I,1)*BI(JJ)
  110 CONTINUE
C
  130 CONTINUE
      DO 180 IHH=1,NVU
  180 Y(IHH)=DATI(IJ,IHH)
      DO 190 IVB=1,20
      IF (IAFV(IVB).EQ.0) GO TO 190
      KKK=IAFV(IVB)
      FDATA(KKK)=AI(KKK)+BI(KKK)*Y(IVB)
  190 CONTINUE
C
C     CALCOLO DEL CONTORNO DELLA FACCIA
C
      HSTAR=.5*(1.0+FDATA(1))*CAPH
      THSTAR=(2.0*FDATA(2)-1.0)*3.141593*0.25
      SMALLH=.5*(1.0+FDATA(3))*CAPH
      X0=HSTAR*COS(THSTAR)
      Y0=HSTAR*SIN(THSTAR)
      CU=.5*(SMALLH+Y0-X0**2/(FDATA(4)**2*(SMALLH-Y0)))
      BU=SMALLH-CU
      AU=FDATA(4)*BU
      BUSQ=BU**2
      CL=.5*(-SMALLH+Y0-X0**2/(FDATA(5)**2*(-SMALLH-Y0)))
      BL=SMALLH+CL
      AL=FDATA(5)*BL
      BLSQ=BL**2
      XMAX=X0
      NUP1=NU+1
      YSAME(1)=Y0
      LHSRHS(1)=-X0
      NSTEP=NU/2
      NSTPP1=NSTEP+1
      YSAME(NSTPP1)=SMALLH
      LHSRHS(NSTPP1)=0.0
      STPSIZ=(SMALLH-Y0)/NSTEP
      ISTOP=NSTEP-1
      DO 220 I=1,ISTOP
      IP1=I+1
      YSAME(IP1)=Y0+I*STPSIZ
      NUMI=NUP1-I
      XPLUS=FDATA(4)*SQRT(BUSQ-(YSAME(IP1)-CU)**2)
      IF (XPLUS.GT.XMAX) XMAX=XPLUS
      LHSRHS(IP1)=-XPLUS
      LHSRHS(NUMI)=XPLUS
  220 CONTINUE
      XFACE(1)=LHSRHS(1)
      YFACE(1)=YSAME(1)
```

```
      NUP2=NU+2
      DO 230 I=2,NSTEP
      XFACE(1)=LHSRHS(1)
      YFACE(I)=YSAME(1)
      IX2=NUP2-1
      XFACE(IX2)=LHSRHS(IX2)
  230 YFACE(IX2)=YSAME(I)
      XFACE(NSTPP1)=LHSRHS(NSTPP1)
      YFACE(NSTPP1)=YSAME(NSTPP1)
      YSAME(1)=Y0
      LHSRHS(1)=X0
      NLP1=NL+1
      YSAME(NSTPP1)=-SMALLH
      LHSRHS(NSTPP1)=0.0
      STPSIZ=(Y0+SMALLH)/NSTEP
      DO 240 I=1,ISTOP
      IP1=I+1
      NLM1=NLP1-I
      YSAME(IP1)=Y0-I*STPSIZ
      XPLUS=FDATA(5)*SQRT(BLSQ-(YSAME(I)-CL)**2)
      IF (XPLUS.GT.XMAX) XMAX=XPLUS
      LHSRHS(IP1)=XPLUS
      LHSRHS(NLM1)=-XPLUS
  240 CONTINUE
      NLP2=NL+2
      XFACE(NUP1)=LHSRHS(1)
      YFACE(NUP1)=YSAME(1)
      DO 250 I=2,NSTEP
      XFACE(NU+I)=LHSRHS(I)
      YFACE(NU+I)=YSAME(I)
      IX2=NLP2-I
      XFACE(NU+IX2)=LHSRHS(IX2)
      YFACE(NU+IX2)=YSAME(I)
  250 CONTINUE
      XFACE(NU+NSTPP1)=LHSRHS(NSTPP1)
      YFACE(NU+NSTPP1)=YSAME(NSTPP1)
      XMIN=-XMAX
      YMAX=SMALLH
      YMIN=-SMALLH
C
C     CALCOLO DEL NASO
C
      AN=SMALLH*FDATA(6)
      XNOSE(1)=0.0
      XNOSE(2)=SMALLH*FDATA(20)
      XNOSE(3)=-XNOSE(2)
      YNOSE(1)=AN
      YNOSE(2)=-AN
      YNOSE(3)=YNOSE(2)
      YNOSE(4)=YNOSE(1)
      XNOSE(4)=XNOSE(1)
C
C     CALCOLO DELLA BOCCA
C
```

```
      YM=-SMALLH*(FDATA(6)+(1.0-FDATA(6))*FDATA(7))
      CCC=ABS(FDATA(8))
      IF (CCC.LE.0.) FDATA(8)=.1
      XOFYM=FDATA(5)*SQRT(BLSQ-(YM-CL)**2)
      AX8=SMALLH/ABS(FDATA(8))
      AM=FDATA(9)*AMIN1(XOFYM,AX8)
      NSTEP=NMOUTH/2
      NMP1=NMOUTH+1
      YMOUTH(NSTEP+1)=YM
      XMOUTH(NSTEP+1)=0.0
      STPSIZ=AM/NSTEP
      X8SQ=(SMALLH/FDATA(8))**2
      HBY8=AX8
      IF (FDATA(8).LT.0.0) SIGN=-1.0
      IF (FDATA(8).GT.0.0) SIGN=1.0
      DO 260 I=1,NSTEP
      XPLUS=-AM+(I-1)*STPSIZ
      XMOUTH(I)=XPLUS
      NMMI=NMP1-I
      XMOUTH(NMMI)=-XPLUS
      YMOUTH(I)=YM+SIGN*(HBY8-SQRT(X8SQ-XPLUS**2))
  260 YMOUTH(NMMI)=YMOUTH(I)
C
C     CALCOLO DEGLI OCCHI
C
      YE=SMALLH*(FDATA(6)+(1.0-FDATA(6))*FDATA(10))
      XOFYE=FDATA(4)*SQRT(ABS(BUSQ-(YE-CU)**2))
      XE=XOFYE*(1.0+2.0*FDATA(11))*0.25
      THETA=(2.0*FDATA(12)-1.0)*3.141593*0.2
      X13=FDATA(13)
      L=FDATA(14)*AMIN1(XE,XOFYE-XE)
      LSQ=L**2
      SINTH=SIN(THETA)
      COSTH=COS(THETA)
      R=L/SQRT(COSTH**2+SINTH**2/X13**2)
      PUPILX(1)=-XE+R*(2.0*FDATA(15)-1.0)
      PUPILX(2)=XE+R*(2.0*FDATA(15)-1.0)
      PUPILY(1)=YE+R*(2.*FDATA(15)-1.)*SINTH/COSTH
      RPUP=FDATA(13)*FDATA(14)/3.
      NSTEP=NEYES/4
      STPSIZ=L/NSTEP
      I1=1
      I2=NSTEP+1
      I3=2*NSTEP+1
      I4=3*NSTEP+1
      U=0.0
      V=X13*L
      XSTAR=-V*SINTH
      YSTAR=V*COSTH
      XX=XE+XSTAR
      YY=YE+YSTAR
      XREYE(I2)=XX
      XLEYE(I2)=-XX
      YEYES(I2)=YY
```

```
      XX=XE-XSTAR
      YY=YE-YSTAR
      XREYE(14)=XX
      XLEYE(14)=-XX
      YEYES(14)=YY
      U=L
      XSTAR=U*COSTH
      YSTAR=U*SINTH
      XX=XE+XSTAR
      YY=YE+YSTAR
      XREYE(13)=XX
      XLEYE(13)=-XX
      YEYES(13)=YY
      XX=XE-XSTAR
      YY=YE-YSTAR
      XREYE(11)=XX
      XLEYE(11)=-XX
      YEYES(11)=YY
      I1=I2
      I3=I4
      ISTOP=NSTEP-1
      DO 270 I=1,ISTOP
      U=I*STPSIZ
      V=A13*SQRT(L5Q-U**2)
      XSTAR=U*COSTH-V*SINTH
      YSTAR=U*SINTH+V*COSTH
      XX=XE+XSTAR
      YY=YE+YSTAR
      I2=I2+1
      I4=I4+1
      XREYE(I2)=XX
      XLEYE(I2)=-XX
      YEYES(I2)=YY
      XX=XE-XSTAR
      YY=YE-YSTAR
      XREYE(I4)=XX
      XLEYE(I4)=-XX
      YEYES(I4)=YY
      XSTAR=U*COSTH+V*SINTH
      YSTAR=U*SINTH-V*COSTH
      I1=I1-1
      I3=I3-1
      XX=XE-XSTAR
      YY=YE-YSTAR
      XREYE(I1)=XX
      XLEYE(I1)=-XX
      YEYES(I1)=YY
      XX=XE+XSTAR
      YY=YE+YSTAR
      XREYE(I3)=XX
      XLEYE(I3)=-XX
      YEYES(I3)=YY
  270 CONTINUE
C
```

```
C
C     CALCOLO DELLE SOPRACCIGLIA
C
      YB=YE+2.0*(0.3+FDATA(16))*L*X13
      THSTST=THETA+3.141593*(2.0*FDATA(17)-1.0)*0.2
      COSTH=COS(THSTST)
      SINTH=SIN(THSTST)
      LB=R*(2.0*FDATA(18)+1.0)*0.5
      XX=LB*COSTH+XE
      YY=LB*SINTH+YB
      XRBROW(1)=XX
      XLBROW(1)=-XX
      YBROWS(1)=YY
      XX=-LB*COSTH+XE
      YY=-LB*SINTH+YB
      XRBROW(2)=XX
      XLBROW(2)=-XX
      YBROWS(2)=YY
C
C  CALCOLO DELLE ORECCHIE
C
      REAR=(1.+FDATA(19))*SMALLH*.1
      CEAR=HSTAR+REAR
      EARX=CEAR*COS(THSTAR)
      EARY=CEAR*SIN(THSTAR)
      RETURN
      END
```

```
      SUBROUTINE RANGE(L,Y,VMIN,VMAX)
      DIMENSION Y(1)
      VMIN=Y(1)
      VMAX=Y(1)
      DO 10 I=2,L
      IF(VMIN.LE.Y(I)) GOTO 20
      VMIN=Y(I)
20    IF(VMAX.GE.Y(I)) GOTO 10
      VMAX=Y(I)
10    CONTINUE
      RETURN
      END
```

```
      SUBROUTINE CIRCLE(X0,Y0,RAD,NPTS,ABC,XYZ)
      DIMENSION ABC(20),XYZ(20)
      DELTH=6.283185/FLOAT(NPTS-1)
      THETA=0.0
      XX=X0+RAD
      YY=Y0
      ABC(1)=XX
      XYZ(1)=YY
      M=NPTS-1
      DO 10 I=2,M
      THETA=THETA+DELTH
      ABC(I)=X0+RAD*COS(THETA)
      XYZ(I)=Y0+RAD*SIN(THETA)
10    CONTINUE
      THETA=THETA+DELTH
      ABC(NPTS)=ABC(1)
      XYZ(NPTS)=XYZ(1)
      RETURN
      END
```

```
      SUBROUTINE VDCHER(IJ,NPLOTS,ISw)
C
C  PER LA MODIFICA DESCRITTA IN MGCA, OCCORRE SOSTITUIRE LA PRIMA
C  DIMENSIONE DELLA MATRICE D CON IL VALORE DESIDERATO
C
      COMMON /CVPL1/D(100,20),XFACE(202),YFACE(202),NFACE,
     *       XNOSE(6),YNOSE(6),XMOUTH(53),YMOUTH(53),NMOUTH,XLEYE(83),
     *       XREYE(83),YEYES(83),NEYES,XLBROW(2),XRBROW(2),YBROWS(2),
     *       EARX,EARY,REAR,PUPILX(2),PUPILY(2),RPUP
      COMMON /CV12/SX,SY
C
C
      DIMENSION ABC(22),XYZ(22)
      INTEGER XV1,YV1
C
      IF(ISw.EQ.30) GO TO 200
100   ISw=ISw+1
      K=ISw
      IR=(K-1)/6+1
      IC=K-6*(IR-1)
      XV1=170*IC-85
      YV1=858-156*IR
      GO TO 300
200   CALL TINST(2,IPAUS)
      CALL ERASE
      ISw=0
      GO TO 100
300   IF(IJ.GT.1) GOTO 400
      CALL ERASE
      CALL RANGE(200,XFACE,VMIN,VMAX)
C
C
      SX=VMAX-VMIN
      IF(SX.LT.6.) SX=6.
C
C
400   CALL SWIND(XV1,YV1,77,77)
      CALL VWIND(0.,0.,SX,SX,0.)
C
C
C   INIZIA IL DISEGNO DELLA FACCIA
C
      CALL TRACON(NFACE,XFACE,YFACE)
C
C   DISEGNO DEL NASO
C
      CALL TRACON(4,XNOSE,YNOSE)
C
C   DISEGNO DELLA BOCCA
C
      CALL TRACON(51,XMOUTH,YMOUTH)
C
C   DISEGNO DEGLI OCCHI
C
```

```
      CALL TRACON(80,XLEYE,YEYES)
      CALL TRACON(80,XREYE,YEYES)
C
C   DISEGNO DELLE ORECCHIE
C
      CALL CIRCLE(EARX,EARY,REAR,20,ABC,XYZ)
      CALL TRACON(20,ABC,XYZ)
      CALL CIRCLE(-EARX,EARY,REAR,20,ABC,XYZ)
      CALL TRACON(20,ABC,XYZ)
C
C   CALCOLO DELLE PUPILLE E DISEGNO
C
      CALL CIRCLE(PUPILX(1),PUPILY(1),RPUP,20,ABC,XYZ)
      CALL TRACON(20,ABC,XYZ)
      CALL CIRCLE(PUPILX(2),PUPILY(1),RPUP,20,ABC,XYZ)
      CALL TRACON(20,ABC,XYZ)
C
C   DISEGNO DELLE SOPRACCIGLIA
C
      CALL VPLOT(XLBROW(1),YBROWS(1),0)
      CALL VPLOT(XLBROW(2),YBROWS(2),1)
      CALL VPLOT(XRBROW(1),YBROWS(1),0)
      CALL VPLOT(XRBROW(2),YBROWS(2),1)
C
      CALL VPLOT(-1.,-5.8,0)
      CALL CODIF1(IJ,IJC)
      CALL ANSTR(2,IJC)
C
      IF(IJ.NE.NPLOTS) GO TO 1000
      ISW=0
      CALL TINST(2,IPAUS)
      CALL ERASE
 1000 RETURN
      END
```

```
      SUBROUTINE TRACON(LVX,NVX,NVY)
C
      COMMON /COEF/S,C,T1,T2,GX,GY,MX,MY,CX,CY
C
      REAL NVX(1),NVY(1)
C
      CALL VPLOT(NVX(1),NVY(1),0)
      DO 100 N=2,LVX
  100 CALL VPLOT(NVX(N),NVY(N),1)
C
      RETURN
      END
```

```
      SUBROUTINE PLCHER(IJ)
C
C  PER LA MODIFICA DESCRITTA IN MGCA, OCCORRE SOSTITUIRE LA PRIMA
C  DIMENSIONE DELLA MATRICE D CON IL VALORE DESIDERATO
C
      COMMON /CVPL1/D(100,20),XFACE(202),YFACE(202),NFACE,
     *       XNOSE(6),YNOSE(6),XMOUTH(53),YMOUTH(53),NMOUTH,XLEYE(83),
     *       XREYE(83),YEYES(83),NEYES,XLBROW(2),XRBROW(2),YBROWS(2),
     *       EARX,EARY,REAR,PUPILX(2),PUPILY(2),RPUP
      COMMON /CPL1/PX,PY
      DIMENSION ABC(22),XYZ(22)
      REAL K
C
C
        CALL PLOTS(0.,0.,6)
        CALL FACTOR(.5)
        IF(IJ.GT.1) GO TO 1
        XXX=0.
      YYY=0.
        PX=1.
        PY=1.
        GOTO 20
    1   K=FLOAT(IJ)-1.
        IF((AINT(K/4.)-K/4.)*10.EQ.0.)GO TO 2
        XXX=9.
      YYY=0.
      GOTO 20
    2   IF((AINT(K/20.)-K/20.)*10.EQ.0.)GO TO 3
        XXX=-27.
      YYY=-9.
      GOTO 20
    3   XXX=14.
        YYY=36.
   20   CALL PLOT(XXX,YYY,-3)
        XFACE(NFACE+2)=PX
      YFACE(NFACE+2)=PY
      CALL LINE(XFACE,YFACE,NFACE,1,0,0)
      XNOSE(6)=PX
      YNOSE(6)=PY
      CALL PLOT(0.,0.,-3)
      CALL LINE(XNOSE,YNOSE,4,1,0,0)
      XMOUTH(NMOUTH+2)=PX
      YMOUTH(NMOUTH+2)=PY
      CALL PLOT(0.,0.,-3)
      CALL LINE(XMOUTH,YMOUTH,NMOUTH,1,0,0)
        NNEYES=NEYES+1
      XREYE(NNEYES)=XREYE(1)
      XLEYE(NNEYES)=XLEYE(1)
      YEYES(NNEYES)=YEYES(1)
      XREYE(NEYES+3)=PX
      XLEYE(NEYES+3)=PX
      YEYES(NEYES+3)=PY
      CALL PLOT(0.,0.,-3)
      CALL LINE(XREYE,YEYES,NNEYES,1,0,0)
```

```
CALL PLOT(0.,0.,-3)
CALL LINE(XLEYE,YEYES,NNEYES,1,0,0)
CALL PLOT(XRBROW(1),YBROWS(1),3)
CALL PLOT(XRBROW(2),YBROWS(2),2)
CALL PLOT(0.,0.,-3)
CALL PLOT(XLBROW(1),YBROWS(1),3)
CALL PLOT(XLBROW(2),YBROWS(2),2)
  CALL PLOT(0.,0.,-3)
CALL CIRCLE(PUPILX(1),PUPILY(1),RPUP,20,ABC,XYZ)
  ABC(22)=PX
  XYZ(22)=PY
CALL LINE(ABC,XYZ,20,1,0,0)
CALL PLOT(0.,0.,-3)
CALL CIRCLE(PUPILX(2),PUPILY(1),RPUP,20,ABC,XYZ)
  ABC(22)=PX
  XYZ(22)=PY
CALL LINE(ABC,XYZ,20,1,0,0)
CALL PLOT(0.,0.,-3)
CALL CIRCLE(EARX,EARY,REAR,20,ABC,XYZ)
  ABC(22)=PX
  XYZ(22)=PY
CALL LINE(ABC,XYZ,20,1,0,0)
CALL PLOT(0.,0.,-3)
CALL CIRCLE(-EARX,EARY,REAR,20,ABC,XYZ)
  ABC(22)=PX
  XYZ(22)=PY
CALL LINE(ABC,XYZ,20,1,0,0)
CALL PLOT(0.,0.,-3)
  FIJ=FLOAT(IJ)
  CALL NUMBER(0.,-5.,.6,FIJ,0.,-1)
  CALL PLOT(0.,0.,999)
RETURN
END
```

```
      SUBROUTINE CODIFI(INUMER,NUMER)
C
C     SUBROUTINE PER LA CODIFICA IN CARATTERI DEI NUMERI INTERI
C
      BYTE NUMER(2)
      LOGICAL*1 KARAT(5),ICIF(11)
      DATA ICIF/' ','0','1','2','3','4','5','6','7','8','9'/,ISEGN/'-'/
      DO 5 I=1,5
    5 KARAT(I) = ICIF(1)
      INUM = IABS(INUMER)
      DO 10 I=1,4
      INAM = INUM/10
      INEM = INUM-INAM*10
      KARAT(5-I+1) = ICIF(INEM+2)
   10 INUM = INAM
      DO 20 I=2,4
      L = I
      IF(KARAT(I) .NE. ICIF(2)) GO TO 40
   20 KARAT(I) = ICIF(1)
   40 CONTINUE
      IF(INUMER.LT.0) KARAT(L-1) = ISEGN
      NUMER(1)=KARAT(4)
      NUMER(2)=KARAT(5)
      RETURN
      END
```

```
      SUBROUTINE ANDR(NPLOTS,NVREAD,NVAR,D,IJ,VMIN,VMAX,X,VALFU,
     *NP,DATI)
C
C  PER LA MODIFICA DESCRITTA IN MGCA, OCCORRE SOSTITUIRE LA PRIMA
C  DIMENSIONE DELLE MATRICI DATI E D CON IL VALORE DESIDERATO
C
C
      DIMENSION D(100,20),X(100),VALFU(100),DATI(100,20)
C
      INTEGER VAR(20),OP,OS
      READ IER
      DIMENSION XC(20),YC(20),XXC(20),PROG(20),A(210),R(400),P(20)
C
      IF(IJ.GT.1) GO TO 500
C
      DO 50 I=1,20
   50 VAR(I)=0
C
      WRITE(5,310)
      WRITE(4,310)
  310 FORMAT(/,2X,'VARIABILI DA INCLUDERE: SCRIVERE 0 SE SI VUOLE',/,
     *2X,'UTILIZZARE L''INTERA MATRICE, ALTRIMENTI SPECIFICARE',/,
     *2X,'LE VARIABILI RICHIESTE INTRODUCENDO I NUMERI CORRISPONDENTI')
      READ(5,320) (VAR(I),I=1,20)
  320 FORMAT(2013)
C
      IF(VAR(1).GT.0) GOTO 340
      WRITE(4,325)
  325 FORMAT(/,2X,'***   SI UTILIZZA L''INTERA MATRICE DEI DATI')
      NVAR=NVREAD
      DO 330 I=1,NVAR
  330 VAR(I)=I
      GOTO 401
  340 I=1
      NVAR=1
  350 IF(VAR(I+1).EQ.0) GOTO 360
      NVAR=NVAR+1
      I=I+1
      GOTO 350
  360 CONTINUE
      WRITE(4,400) (VAR(J),J=1,NVAR)
  400 FORMAT(/,2X,'***   SI UTILIZZANO LE VARIABILI:  ',/,
     *13X,2013)
  401 DO 410 I=1,NPLOTS
      DO 410 J=1,NVAR
      DATI(I,J)=D(I,VAR(J))
      ICOR=1
  410 CONTINUE
C
      WRITE(5,420)
      WRITE(4,420)
  420 FORMAT(/,2X,'OPZIONI:   0  NESSUNA TRASFORMAZIONE',/,
     *13X,'1  COMPONENTI PRINCIPALI UTILIZZANDO LA MATRICE',/,
     *16X,'DI COVARIANZA',/,
```

```
     *13X,'2  COMPONENTI PRINCIPALI UTILIZZANDO LA MATRICE',/,
     *16X,'DI CORRELAZIONE')
      READ(5,425) OP
      WRITE(4,430) OP
  425 FORMAT(I1)
  430 FORMAT(/,2X,'***   OPZIONE  ',I1)
      IF(OP.EQ.0) GOTO 500
      IF(OP.EQ.1) ICOR=0
      WRITE(5,435)
      WRITE(4,435)
  435 FORMAT(/,2X,'OPZIONI:   0  NESSUNA STAMPA',/,
     *13X,'1  STAMPA DI INFORMAZIONI RIASSUNTIVE SULLE',/,
     *16X,'VARIABILI E SULLE COMPONENTI PRINCIPALI')
      READ(5,425) OS
      WRITE(4,430) OS
      CALL CORR(NPLOTS,NVAR,ICOR,YC,XC,A,DATI,OS)
      CALL CORCOV(NVAR,ICOR,A,OS)
      IER=0.
      CALL RJCEI(NVAR,IER,A,R)
      IF(IER.LT.0) GOTO 1000
      CALL ORD(NVAR,A,R)
      CALL PERC(A,P,PROG,NVAR,OS)
      CALL TRAS(NPLOTS,NVAR,NVAR,ICOR,XXC,XC,YC,R,DATI)
      CALL LOAD(NVAR,NVAR,ICOR,XC,A,R,OS)
  500 CONTINUE
      PASSO=2.*3.14159/99.
      X(1)=-3.14159
      DO 520 IX=2,100
      X(IX)=X(IX-1)+PASSO
  520 CONTINUE
      VF=DATI(IJ,1)/1.41421
      VMIN=VF
      VMAX=VF
      DO 560 IX=1,100
      SOM=0.
      DO 560 KK=2,NVAR,2
      IF(KK-NVAR)530,540,530
  530 E=DATI(IJ,KK+1)
      GOTO 550
  540 E=0.
  550 SOM=SOM+DATI(IJ,KK)*SIN(FLOAT(KK/2)*X(IX))
      SOM=SOM+E*COS(FLOAT(KK/2)*X(IX))
  560 CONTINUE
      VALFU(IX)=VF+SOM
      IF(VMIN.LE.VALFU(IX)) GOTO 570
      VMIN=VALFU(IX)
  570 IF(VMAX.GE.VALFU(IX)) GOTO 580
      VMAX=VALFU(IX)
  580 CONTINUE
 1000 RETURN
      END
```

```
      SUBROUTINE COPR(N,M,ICOR,Y,X,A,DATI,OS)
C
C     PER LA MODIFICA DESCRITTA IN MGCA, OCCORRE SOSTITUIRE LA PRIMA
C     DIMENSIONE DELLA MATRICE DATI CON IL VALORE DESIDERATO
C
C
      DIMENSION DATI(100,20)
      DIMENSION X(1),Y(1),A(1)
      INTEGER OS
C
C
      EN=N
      MMP12=M*(M+1)/2
      DO 10 J=1,M
   10 Y(J)=0.
      DO 20 J=1,MMP12
   20 A(J)=0.
      DO 40 L=1,N
      DO 30 J=1,M
      X(J)=DATI(L,J)
30    CONTINUE
      LK=0
      DO 40 J=1,M
      Y(J)=Y(J)+X(J)
      DO 40 K=1,J
      LK=LK+1
   40 A(LK)=A(LK)+X(J)*X(K)
      LK=0
      DO 45 J=1,M
      DO 45 K=1,J
      LK=LK+1
   45 A(LK)=(A(LK)-Y(J)*Y(K)/EN)/EN
      DO 50 J=1,M
      Y(J)=Y(J)/EN
      LL=J+(J*J-J)/2
   50 X(J)=SQRT(A(LL))
      IF(OS.EQ.0) GOTO 150
      WRITE(4,100)
  100 FORMAT(1H1,'VARIABILE                              MEDIA
     *EVIAZIONE STANDARD')
      DO 105 J=1,M
  105 WRITE(4,110)J,Y(J),X(J)
  110 FORMAT(/,5X,I5,14X,E11.4,27X,E11.4)
  115 IF(ICOR.EQ.1) GO TO 125
      WRITE(4,120)
  120 FORMAT(1H1,40X,'SI LAVORA CON LA MATRICE DI COVARIANZA')
      GO TO 135
  125 WRITE(4,130)
  130 FORMAT(1H1,40X,'SI LAVORA CON LA MATRICE DI CORRELAZIONE')
  135 WRITE(4,140)
  140 FORMAT(//,41X,'****************************************')
  150 IF(ICOR.NE.1) GOTO 500
      LK=0
      DO 180 J=1,M
```

```
      DO 180 K=1,J
      LK=LK+1
      A(LK)=A(LK)/(X(J)*X(K))
180   CONTINUE
500   RETURN
      END
```

```
      SUBROUTINE FUCEI(M,IER,A,R)
C
C
      REAL IER
      REAL MITER
      DIMENSION A(1),R(1)
C
C
      EPS=1.0E-08
      ZM=M
      MN=M*M
      ZZ=MN
      MM1=M-1
      IF(IER)10,10,15
   10 IER=ZZ*ZZ/4.
   15 MP1=M+1
      DO 20 I=1,MN
      R(I)=0.
   20 CONTINUE
      DO 24 I=1,MN,MP1
      R(I)=1.
   24 CONTINUE
   25 IF(MM1)200,180,27
   27 ANORM=0.
      II=0
      DO 36 I=1,MM1
      II=II+I
      IJ=II+1
      IP1=I+1
      DO 35 J=IP1,M
      ANORM=ANORM+A(IJ)*A(IJ)
      IJ=IJ+J
   35 CONTINUE
   36 CONTINUE
      IF(ANORM)165,165,40
   40 ANORM=SQRT(2.*ANORM)
      ANORX=ANORM*EPS
      MITER=0
      IND=0
      THR=ANORM
   45 THR=THR/ZM
   50 IMTHR=M
      IATHR=0
      LEP=0
      LL=0
      DO 150 L=1,MM1
      LL=LL+L
      MM=LL
      LM=LL+L
      LP1=L+1
      DO 140 MP=LP1,M
      MM=MM+MP
      ALM=A(LM)
      IF(ABS(ALM)-THR)130,65,65
```

```
 65 IND=1
    IF(NITER-IER)68,68,185
 68 X=A(LL)-A(MM)
    TANX=2.*ALM/(ABS(X)+SQRT(X*X+4.*ALM*ALM))
    IF(X)70,75,75
 70 TANX=-TANX
 75 TANX2=TANX*TANX
    COSX2=1./(1.+TANX2)
    COSX=SQRT(COSX2)
    SINX=COSX*TANX
    MML=MP-L
    ILL=LLP+1
    DO 125 I=1,M
    KPIL=1
    IF(IL-LL)80,110,85
 80 IM=MMP+I
    KPIL=1
    GO TO 100
 85 IF(IL-LM)90,105,95
 90 IM=IM+1
    GO TO 100
 95 IM=IL+MML
100 X=A(IL)*COSX+A(IM)*SINX
    A(IM)=-A(IL)*SINX+A(IM)*COSX
    A(IL)=X
105 IL=IL+KPIL
    GO TO 115
110 IM=LM
    IL=IL+KPIL
115 ILR=INILR+1
    IMR=INIMR+1
    X=R(ILR)*COSX+R(IMR)*SINX
    R(IMR)=-R(ILR)*SINX+R(IMR)*COSX
    R(ILR)=X
125 CONTINUE
    X=2.*ALM*TANX
    Y=COSX2*(A(LL)+X+TANX2*A(MM))
    X=COSX2*(A(MM)-X+TANX2*A(LL))
    A(LM)=0.
    A(LL)=Y
    A(MM)=X
    NITER=NITER+1
130 INIMR=INIMR+M
    LM=LM+MP
    MMP=MM
140 CONTINUE
    INILR=INILR+M
    INIMR=INILR+M
    LLP=LL
    MMP=LLP+LP1
150 CONTINUE
    IF(IND-1)160,155,160
155 IND=0
    GO TO 50
```

```
  160 IF(IMR-ANURX)165,165,45
  165 IJ=1
      II=1
      DO 170 I=2,M
      II=II+1
      IJ=IJ+1
      A(IJ)=A(II)
  170 CONTINUE
  180 IER=0
      RETURN
  185 IER=-1
      RETURN
  200 IER=1
      RETURN
      END
```

```
      SUBROUTINE ORD(M,A,R)
C
C
      DIMENSION A(1),R(1)
C
C
      MM=M*M
      IQ=-M
      M1=M-1
      DO 35 I=1,M1
      IQ=IQ+M
      JQ=IQ
      II=I+1
      DO 35 J=II,M
      JQ=JQ+M
      IF(A(I)-A(J))15,35,35
   15 X=A(I)
      A(I)=A(J)
      A(J)=X
      DO 25 K=1,M
      ILR=IQ+K
      IMR=JQ+K
      X=R(ILR)
      R(ILR)=R(IMR)
   25 R(IMR)=X
   35 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE TRAS(N,M,KCOM,ICOR,XX,X,Y,R,DATI)
C
C  PER LA MODIFICA DESCRITTA IN MGCA, OCCORRE SOSTITUIRE LA PRIMA
C  DIMENSIONE DELLA MATRICE DATI CON IL VALORE DESIDERATO
C
C
      DIMENSION XX(1),X(1),Y(1),R(1)
      DIMENSION DATI(100,20)
C
      DO 60 I=1,N
      DO 10 J=1,M
      XX(J)=DATI(I,J)
   10 CONTINUE
      DO 20 J=1,M
      XX(J)=XX(J)-Y(J)
      IF(ICOR.NE.1) GO TO 20
      XX(J)=XX(J)/X(J)
   20 CONTINUE
      DO 40 J=1,KCOM
      SUM=0.
      DO 30 K=1,M
      MM=(J-1)*M+K
   30 SUM=SUM+XX(K)*R(MM)
   40 XX(J)=SUM
      DO 50 J=1,KCOM
      DATI(I,J)=XX(J)
   50 CONTINUE
   60 CONTINUE
      RETURN
      END
```

```
      SUBROUTINE PERC(A,P,PROG,M,OS)
      DIMENSION A(1),P(1),PROG(1)
      INTEGER OS
      SUM=0.
      DO 1 I=1,M
      SUM=SUM+A(I)
    1 CONTINUE
      PSUM=0.
      IF(OS.EQ.1) WRITE(4,50)
      DO 2 I=1,M
      P(I)=A(I)/SUM*100.
      PSUM=PSUM+P(I)
      PROG(I)=PSUM
      IF(OS.EQ.1) WRITE(4,100)I,A(I),P(I),PROG(I)
    2 CONTINUE
   50 FORMAT(1H1,10X,'VARIANZE DELLE COMPONENTI',10X,'% DELLA VARIANZA T
     *OTALE',10X,'% PROGRESSIVA')
  100 FORMAT(/,5X,I5,13X,E13.6,25X,F8.4,15X,F8.4)
      RETURN
      END
```

```
      SUBROUTINE CORCOV(N,ICOR,A,OS)
C
C
      DIMENSION A(1)
      INTEGER OS
C
C
      IF(ICOR.EQ.1) GO TO 10
      IF(OS.EQ.1) WRITE(4,300)
      GO TO 20
   10 IF(OS.EQ.1) WRITE(4,350)
   20 KK=N/9
      KK=KK+1
      K=1
      DO 70 L=1,N
      IF(L.GT.9) GO TO 30
      IF(OS.EQ.1) WRITE(4,100)(II,II=1,L)
      KJ=K+L-1
      IF(OS.EQ.1) WRITE(4,150)L,(A(J),J=K,KJ)
      GO TO 70
   30 IL=1
      DO 65 LL=1,KK
      L9=LL*9
      IF(L.LE.L9) GO TO 50
      IF(OS.EQ.1) WRITE(4,100)(II,II=IL,L9)
      KJ=K+8
      IF(OS.EQ.1) WRITE(4,150)L,(A(J),J=K,KJ)
      GO TO 60
   50 IF(OS.EQ.1) WRITE(4,100)(II,II=IL,L)
      KJ=K+L-IL
      IF(OS.EQ.1) WRITE(4,150)L,(A(J),J=K,KJ)
      GO TO 70
   60 K=KJ+1
      IL=L9+1
   65 CONTINUE
   70 K=KJ+1
C
  100 FORMAT(10X,9(8X,I4))
  150 FORMAT(2X,I4,4X,9E12.5)
  300 FORMAT(1H1,' VALORI DELLE COVARIANZE',//)
  350 FORMAT(1H1,' VALORI DELLE CORRELAZIONI',//)
      RETURN
      END
```

```
      SUBROUTINE LOAD(M,KCOM,ICOR,X,A,R,OS)
C
C
      DIMENSION R(1),A(1),X(1)
      INTEGER OS
C
      K=1
      DO 100 I=1,KCOM
      KK=K+M-1
      LL=0
      DO 50 L=K,KK
      LL=LL+1
      R(L)=R(L)*SQRT(A(I))
      IF(ICOR.EQ.1) GO TO 50
      R(L)=R(L)/X(LL)
   50 CONTINUE
  100 K=K+M
      IF(OS.EQ.1) WRITE(4,110)
  110 FORMAT(1H1,'CORRELAZIONE FRA LE VARIABILI ORIGINARIE E LE COMPONEN
     *TI ESTRATTE',//)
      I=1
      KK=KCOM/10
      KK=KK+1
      DO 200 L=1,KK
      J=I+9
      IF(J.GE.KCOM) GO TO 210
      IF(OS.EQ.1) WRITE(4,230)(K,K=I,J)
      DO 120 K=1,M
      LL=M*(I-1)+K
      MM=M*J
  120 IF(OS.EQ.1) WRITE(4,240)K,(R(II),II=LL,MM,M)
  200 I=I+10
  210 IF(OS.EQ.1) WRITE(4,230)(K,K=I,KCOM)
      DO 220 K=1,M
      LL=M*(I-1)+K
      MM=M*KCOM
  220 IF(OS.EQ.1) WRITE(4,240)K,(R(II),II=LL,MM,M)
  230 FORMAT(//,5X,10(6X,I4))
  240 FORMAT(/,1X,I4,10E12.4)
      RETURN
      END
```

```
      SUBROUTINE VDANDR(IJ,NPLOTS,VMIN,VMAX,X,VALFU,NP,KP)
C
C
      DIMENSION X(100),VALFU(100)
      INTEGER ISCAL(22)
      DIMENSION VAXX(2),VAXY(11)
C
      COMMON /CV12/SX,SY
      REAL K
      DATA ISCAL/'  ','10',' ',' 8',' ',' 6',' ',' 4',
     *' ',' 2',' ',' 0',' ','-2',' ','-4',' ','-6',
     *' ','-8',' -','10'/
     *     VAXX/-8.1,-7.85/,
     *     VAXY/10.,8.,6.,4.,2.,0.,-2.,-4.,-6.,-8.,-10./
C
      IF(IJ.GT.1) GO TO 50
C
      WRITE(5,10)
   10 FORMAT('$ N. DI CURVE SU OGNI GRAFICO:  ')
      READ(5,20) NP
   20 FORMAT(I2)
C
      CALL SWIND(512,390,450,320)
      W=ABS(VMIN)
      IF(ABS(VMAX).GT.W) W=ABS(VMAX)
      SY=1.
   30 IF(INT(W).LE.9) GOTO 50
      W=W/10.
      SY=SY*10.
      GOTO 30
C
50    CALL VWIND(0.,0.,10.,10.,0.)
      K=IJ-1
      IF((AINT(K/FLOAT(NP))-K/FLOAT(NP))*10.NE.0.)GO TO 200
      IF(IJ.NE.1) CALL TINST(2,IPAUS)
      CALL ERASE
      KP=5
C
C  DISEGNO DEGLI ASSI
C
      CALL VPLOT(-7.85,0.,0)
      CALL VPLOT(7.85,0.,1)
      CALL VPLOT(-7.85,-10.,0)
      CALL VPLOT(-7.85,10.,1)
      V=VAXX(1)-.7
      DO 100 IV=1,11
      CALL VPLOT(V,VAXY(IV),0)
      CALL ANSTR(2,ISCAL(2*IV-1))
      CALL ANSTR(2,ISCAL(2*IV))
      CALL VPLOT(VAXX(1),VAXY(IV),0)
      CALL VPLOT(VAXX(2),VAXY(IV),1)
  100 CONTINUE
C
C  DISEGNO DELLE CURVE
```

```
C
  200 XF=X(1)*2.5
      VF=VALFU(1)/SY
      CALL VPLOT(XF,VF,0)
      DO 300 N=2,100
      VF=VALFU(N)/SY
      XF=X(N)*2.5
  300 CALL VPLOT(XF,VF,1)
      CALL CODIFI(IJ,IJC)
      KP=KP+5
      DO 500 KK=KP,100,28
      VF=VALFU(KK)/SY
      XF=X(KK)*2.5
      CALL VPLOT(XF,VF,0)
      CALL ANSTR(2,IJC)
  500 CONTINUE
      IF(IJ.NE.NPLOTS) GO TO 1000
      CALL TINST(2,IPAUS)
C
 1000 RETURN
      END
```

```
      SUBROUTINE PLANDR(IJ,VMIN,VMAX,X,VALFU,NP,NPAG,KP)
C
      DIMENSION X(100),VALFU(100)
C
      COMMON /CPL2/SCX,SCY,FAC,LX,LY,SCY1
      REAL K,LX,LY,LX2,LY2
C
      CALL PLOTS(0.,0.,6)
      IF(IJ.GT.1) GO TO 100
C
      WRITE(5,10)
   10 FORMAT('$ N. DI CURVE SU OGNI GRAFICO:  ')
      READ(5,20) NP
   20 FORMAT(I2)
      WRITE(5,12)
   12 FORMAT('$ LUNGHEZZA ASSE X:  ')
      READ(5,14) LX
      WRITE(5,13)
   13 FORMAT('$ LUNGHEZZA ASSE Y:  ')
      READ(5,14) LY
   14 FORMAT(F3.0)
      WRITE(5,30)
   30 FORMAT('$ FATTORE DI RIDUZIONE:  ')
      READ(5,40) FAC
   40 FORMAT(F2.1)
C
      CALL FACTOR(FAC)
      SCX=6.28/LX
      W=ABS(VMIN)
      IF(ABS(VMAX).GT.W) W=ABS(VMAX)
      SCY=1.
   47 IF(INT(W).LE.9) GO TO 48
      SCY=SCY*10.
      W=W/10.
      GO TO 47
48    CONTINUE
      CALL PLOT(0.,0.,-3)
      KP=6
      NPAG=0
      GO TO 110
C
  100 CALL FACTOR(FAC)
      K=FLOAT(IJ)-1.
      IF((AINT(K/FLOAT(NP))-K/FLOAT(NP))*10.NE.0.)GOTO 150
      IF(NPAG.NE.0) GOTO 120
      SX=LX+3.
      CALL PLOT(0.,-SX,-3)
      KP=6
      NPAG=1
      GOTO 110
  120 SX=LX+3.
      CALL PLOT(SX,SX,-3)
      KP=6
      NPAG=0
```

```
      LX2=-LX/2.
      CALL AXIS(LX2,0.,1H ,-1,LX,0.,-3.141,SCX)
      SCY1=16./LY
      LY2=-LY/2
      CALL AXIS(LX2,LY2,1H ,+1,LY,90.,-9.,SCY1)
      PS=LX2-1.5
      SX=.09+LX/100.
      CALL SYMBOL(PS,0.,SX,4,90.,-1)
      PS=PS+.02
      SX=SX+.05
      CALL NUMBER(PS,.8,SX,SCY,90.,2)
  150 CALL PLOT(0.,0.,-3)
      SX=.12+LX/100.
      XS=X(1)/SCX
      VFS=VALFU(1)/(SCY*SCY1)
      CALL PLOT(XS,VFS,3)
      DO 180 J2=2,100
      XS=X(J2)/SCX
      VFS=VALFU(J2)/(SCY*SCY1)
      CALL PLOT(XS,VFS,2)
      IF(J2.EQ.KP) GO TO 185
      IF(J2.LT.KP) GO TO 180
      KONT=KONT+1
      IF(KONT.EQ.28) GO TO 185
      GO TO 180
  185 VW=VFS+.1
      FIJ=FLOAT(IJ)
      CALL NUMBER(XS,VW,SX,FIJ,0.,-1)
      CALL PLOT(XS,VFS,3)
      KONT=0
  180 CONTINUE
      KP=KP+4
C
      CALL PLOT(0.,0.,999)
      RETURN
      END
```