```
c       **** 輸入四個端點自動分割四點元素(x_const  假想邊界平面) ****
c       modified 2002/2/12    逆時針


      parameter(nt1=100,nt2=1000)

real x(nt1,nt2),y(nt1,nt2),z(nt1,nt2),xx(nt1,nt2,4),yy(nt1,nt2,4),
/       zz(nt1,nt2,4),a(nt1,nt2),xn(nt1,nt2),yn(nt1,nt2),zn(nt1,nt2)

      OPEN(UNIT=1,FILE='left.in')
      OPEN(UNIT=2,FILE='left_element.dat')
      OPEN(UNIT=3,FILE='left_normal.dat')
      OPEN(UNIT=4,FILE='left_node.dat')

write(*,*) '輸入四個端點自動分割四點元素(x=const)假想邊界平面'
write(*,*) '輸入  A,B,C,D  四個端點的座標'
write(*,*)
write(*,*) '輸　入　例'    2011 埃及尼羅河之旅
write(*,*)
write(*,*)
write(*,*) '          NJ (y)  方向分割數  = 5    '
write(*,*) '    -->   '
write(*,*) '           1    2    3    4    5'
write(*,*) '       1 A---+---+---+---B'
write(*,*) '   N    2 +---+---+---+---+'
write(*,*) '   I    3 +---+---+---+---+'
write(*,*) '   方   4 +---+---+---+---+'
write(*,*) '   向   5 +---+---+---+---+'
write(*,*) '   分   6 D---+---+---+---C'
write(*,*) '   割'
write(*,*) '   數'
write(*,*) '       ='
write(*,*) '    6'


    no=4
write(*,*)
write(*,*) '左岸壁邊界面編號    no = 4'
```
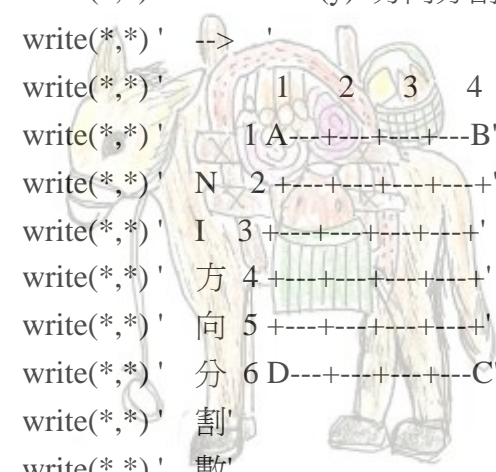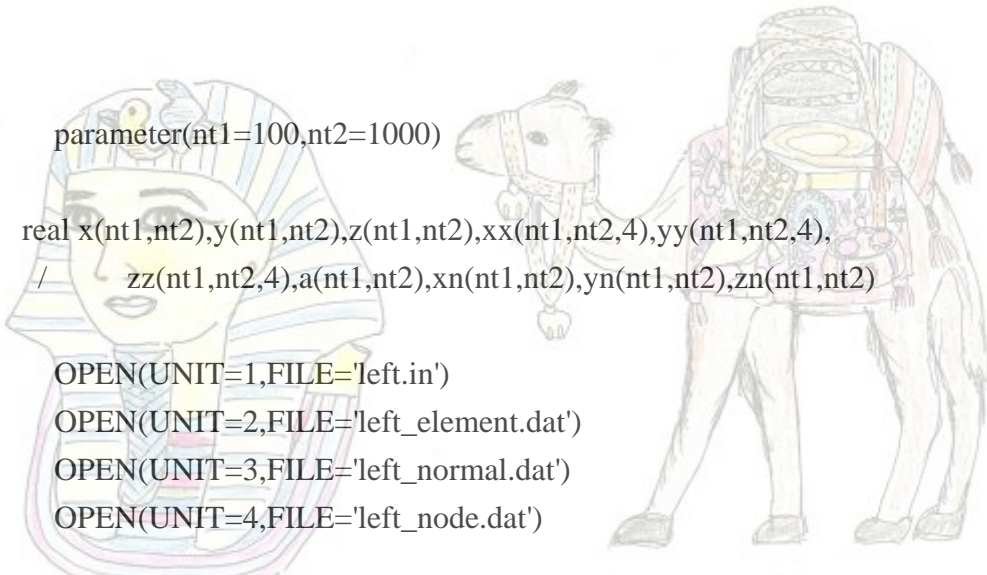
```fortran
write(*,*)
write(*,*) '輸入    x =const x  的座標'
read(*,*) xconst
write(*,*)
write(*,*) '輸入    NI (水深) 方向的座標數'
read(*,*) ni
write(*,*)
write(*,*)
write(*,*) '輸入    NJ (x=const)  方向的座標數'
read(*,*) nj

ni1=ni-1
nj1=nj-1

read(1,*) ya, za
read(1,*) yb, zb
read(1,*) yc, zc
read(1,*) yd, zd

y(1,1)=ya
z(1,1)=za
y(1,nj)=yb
z(1,nj)=zb
y(ni,nj)=yc
z(ni,nj)=zc
y(ni,1)=yd
z(ni,1)=zd

yab=(yb-ya)/nj1
zab=(zb-za)/nj1
ybc=(yc-yb)/ni1
zbc=(zc-zb)/ni1
ycd=(yd-yc)/nj1
zcd=(zd-zc)/nj1
yda=(ya-yd)/ni1
zda=(za-zd)/ni1

do j=2,nj1
```
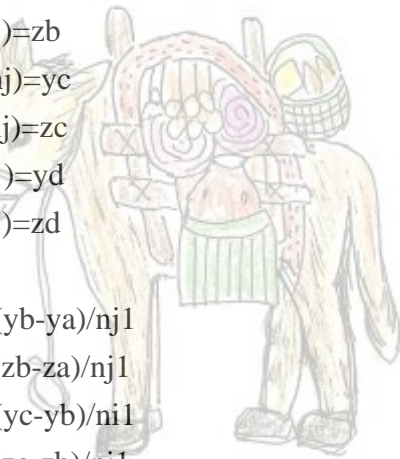
```
y(1,j)=y(1,1)+yab*(j-1)
z(1,j)=z(1,1)+zab*(j-1)
end do

do i=2,ni1
y(i,nj)=y(1,nj)+ybc*(i-1)
z(i,nj)=z(1,nj)+zbc*(i-1)
end do

do j=2,nj1
jj=nj1+2-j
y(ni,jj)=y(ni,nj)+ycd*(j-1)
z(ni,jj)=z(ni,nj)+zcd*(j-1)
end do

do i=2,ni1
ii=ni1+2-i
y(ii,1)=y(ni,1)+yda*(i-1)
z(ii,1)=z(ni,1)+zda*(i-1)
end do

do i=2,ni1
do j=2,nj1
yij=(y(i,nj)-y(i,1))/nj1
zij=(z(i,nj)-z(i,1))/nj1
y(i,j)=y(i,1)+yij*(j-1)
z(i,j)=z(i,1)+zij*(j-1)
end do
end do

do ki=1,ni1
do kj=1,nj1

yy(ki,kj,1)=y(ki+1,kj)
  yy(ki,kj,2)=y(ki+1,kj+1)
yy(ki,kj,3)=y(ki,kj+1)
yy(ki,kj,4)=y(ki,kj)
```
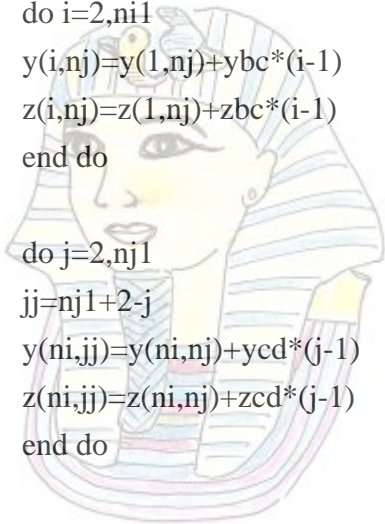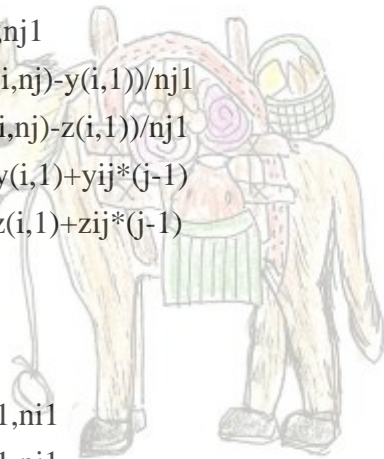
```fortran
zz(ki,kj,1)=z(ki+1,kj)
   zz(ki,kj,2)=z(ki+1,kj+1)
zz(ki,kj,3)=z(ki,kj+1)
zz(ki,kj,4)=z(ki,kj)

   end do
end do

DO KI=1,NI
DO KJ=1,NJ
x(KI,KJ)=xCONST
END DO
END DO

do ki=1,ni1
do kj=1,nj1
do j=1,4
xx(ki,kj,j)=xconst
end do
end do
end do


do ki=1,ni
do kj=1,nj
write(4,3) x(ki,kj),y(ki,kj),z(ki,kj),no,ki,kj
   end do
end do

do ki=1,ni1
do kj=1,nj1
write(2,4)((xx(ki,kj,j),yy(ki,kj,j),zz(ki,kj,j),no,ki,kj,j),j=1,4)
   end do
end do

   CALL normal(Xx,Yy,Zz,XN,YN,ZN,A,NT1,NT2,NI1,NJ1)

   do ki=1,ni1
do kj=1,nj1
```
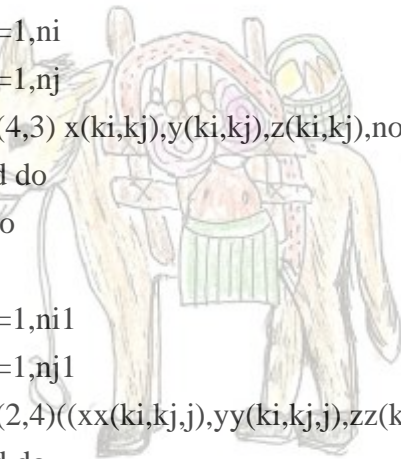
```fortran
        write(3,2) xn(ki,kj),yn(ki,kj),zn(ki,kj),a(ki,kj),no,ki,kj
        end do
        end do
4       FORMAT(3F10.4,4i5)
3       FORMAT(3F10.4,3i5)
2       FORMAT(4F10.4,3i5)

        stop
        end

C*************************************************
        SUBROUTINE normal(X,Y,Z,XN,YN,ZN,A,M,L,NI1,NJ1)
        REAL X(M,L,4),Y(M,L,4),Z(M,L,4),XN(M,L),YN(M,L),ZN(M,L),A(M,L)

        DO I=1,NI1
        DO J=1,NJ1
        R1=X(I,j,3)-X(I,J,1)
        R2=Y(I,J,3)-Y(I,J,1)
        R3=Z(I,J,3)-Z(I,J,1)
        R4=X(I,J,4)-X(I,J,2)
        R5=Y(I,J,4)-Y(I,J,2)
        R6=Z(I,J,4)-Z(I,J,2)
        R=SQRT((R5*R3-R6*R2)**2+(R6*R1-R4*R3)**2+(R4*R2-R5*R1)**2)

        XN(I,J)=(R5*R3-R6*R2)/R
        YN(I,J)=(R6*R1-R4*R3)/R
        ZN(I,J)=(R4*R2-R5*R1)/R

        T1=X(I,J,2)-X(I,J,1)
        T2=Y(I,J,2)-Y(I,J,1)
        T3=Z(I,J,2)-Z(I,J,1)
        T4=X(I,J,4)-X(I,J,1)
        T5=Y(I,J,4)-Y(I,J,1)
        T6=Z(I,J,4)-Z(I,J,1)

        R=.5*SQRT((T2*R3-T3*R2)**2+(T3*R1-T1*R3)**2+(T1*R2-T2*R1)**2)
        T=.5*SQRT((R2*T6-R3*T5)**2+(R3*T4-R1*T6)**2+(R1*T5-R2*T4)**2)
        A(I,J)=R+T
```
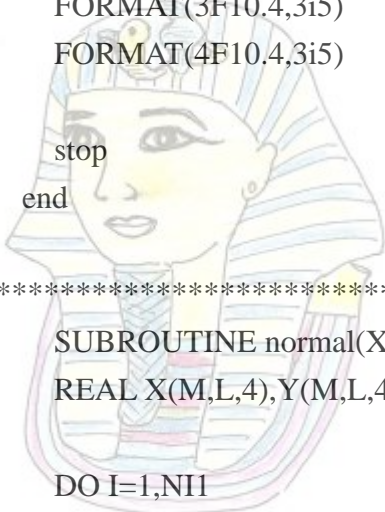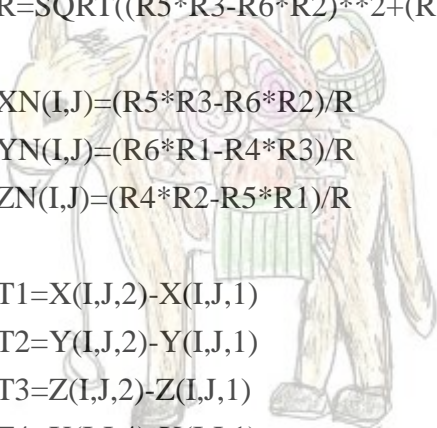
END DO
END DO

RETURN
END

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阿拉丁神燈