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10 OPEN#0,"ELEM,2"
20 OPEN#1,"INTER,2"
30 OPEN#2,"MATRIZ,2"
40 CHR$(27),"*"
50 TAB(04),"=====
60 TAB(10),"PROGRAMA DE SIMULACION DE ACUIFEROS"!!\!
70 TAB(09),"APLICACION DEL ELEMENTO FINITO PARA EL"
80 TAB(12),"ESTADO BIDIMENSIONAL ESTABLECIDO"
90 TAB(04),"=====
100 !\!\!
110 DIME(16),N(13)
120 INPUT"Numero de nodos incognitas del sistema ",N1
130 INPUT"Numero de elementos del sistema ",N2
140 INPUT"Cuantos nodos tienen carga conocida? ",N3
150 !\!" Desea impresion en hojas? ",\R$=INCHAR$(0)\!IF R$="S" THENQ=1
160 FOR I=1 TO N1\N3+1\WRITE#2ZI*(5*(N1+N3)+5*(J-1),0\NEXTJ\NEXT I
170 CHR$(27),"*\!#Q" DATOS DE ENTRADA"\!#Q
180 #QTAB(10),"EL SISTEMA CUENTA CON ",N1+N3," NODOS, DE LOS"
190 #QTAB(10),"CUALES, ",N1," SON NODOS INCOGNITAS Y ",N3
200 #QTAB(10),"NODOS CON CARGA CONOCIDA, GENERANDOSE ",N2
210 #QTAB(10),"ELEMENTOS DE TIPO TRIANGULAR"
220 #QV!#Q" INFORMACION INICIAL "\!#Q
230 FOR I=1 TO N2\WRITE#0ZI*40,0,0,0,0,0,0,0,0,0\NEXT I
240 FOR I=1 TO N1+N3\WRITE#1ZI*65,0,0,0,0,0,0,0,0,0,0,0\NEXT I
250 FOR I=1 TO N1+N3\FOR J=1 TO N1+N3+1\WRITE#2ZI*(5*(N1+N3)+5*(J-1),0\NEXTJ!\NEXT I
260 !"ENTRA EL NUMERO DE ELEMENTO Y SUS VERTICES I, J, K"\!ELEM I J K"
270 !
280 FOR L=1 TO N2
290 INPUT",E!\TAB(7),\INPUT",E(1)\!\TAB(12),\INPUT",E(2)\!\TAB(17),\INPUT",E(3)
300 WRITE#0ZE*40,E(1),E(2),E(3),NOENDMARK
310 NEXTL
320 FOR I=1 TO N1+N3\ L=1
330 FOR H1=1 TO 10\N(H1)=0\ NEXT H1
340 FOR J=1 TO N2
350 READ#0ZJ*40,E(1),E(2),E(3)
360 FOR K=1 TO 3
370 IF I=E(K) THEN 380 ELSE 400
380 N(L)=J
390 L=L+1\EXIT 410
400 NEXT K
410 NEXT J
420 WRITE#1ZI*65,N(1),N(2),N(3),N(4),N(5),N(6),N(7),N(8),N(9),N(10),NOENDMARK
430 NEXT I
440 #QV!#Q!\#Q
450 !\!"ENTRAN EL NODO Y SUS COORDENADAS X,Y"\!NODO <X,Y>\!\!
460 FOR I=1 TO N1+N3
470 INPUT",N!\TAB(7),"<","\INPUT",N(11)\! ", "\INPUT",N(12)\!">"
480 WRITE#1ZN* 65+50 ,N(11),N(12),NOENDMARK
490 NEXT I
500 !
510 !\!"ENTRAN NODO Y SU CARGA CONOCIDA U(I)"!\!NODO U(I)\!\!
520 FOR I=1 TO N3
530 INPUT",N!\TAB(9),\INPUT",N(13)
540 WRITE#1ZN*65+60,N(13),NOENDMARK
550 WRITE#2ZN*(5*(N1+N3+1)+(5*(N1+N3)),N(13),NOENDMARK
560 NEXT I
570 !\!
580 !"Es Tx=Ty ? ",\R$=INCHAR$(0)\!
590 IF R$="S" THEN 600 ELSE 700
600 !"Es la transmisibilidad constante para todo el sistema? ",\R$=INCHAR$(0)\!
610 IF R$="S" THEN 620 ELSE 660
620 !\INPUT"DAME TRANSMISIBILIDAD CONSTANTE ",E(4)
630 FOR I=1 TO N2
640 WRITE#0ZI*40+15,E(4),E(4),NOENDMARK
650 NEXT I\ GOTO 800
660 !\!"ENTRAN EL ELEMENTO Y LAS TRANSMISIBILIDADES: <Tx=Ty>"!\!ELEM Tx=Ty"\!\FOR I=1 TO N2
670 INPUT",E!\TAB(10),\INPUT",E(4)
680 WRITE#0ZE*40+15,E(4),E(4),NOENDMARK
690 NEXT I!\ GOTO 800
700 !"Es la Transmisibilidad constante para todo el sistema? ",\R$=INCHAR$(0)\!

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710 IF R#="S" THEN 720 ELSE 760
720 !\!"DAME LAS TRANSMISIBILIDADES <Tx,Ty> <"," \INPUT1","E(4)\!" , ", \INPUT1","E(5)\!">\!"
730 FOR I=1 TO N2
740 WRITE#OZI#40+15,E(4),E(5),NOENDMARK
750 NEXT I GOTO 800
760 !\!"ENTRAN ELEMENTO Y TRANSMISIBILIDADES <Tx,Ty> "\!"ELEM <Tx,Ty>\!"\FOR I=1 TO N2
770 INPUT1","E\!TAB(8),<" \INPUT1","E(4)\!" , ", \INPUT1","E(5)\!">
780 WRITE#OZE#40+15,E(4),E(5),NOENDMARK
790 NEXT I
900 !\!"Es constante el Coeficiente de Almacenamiento? ",\R#="INCHAR$(0)\!"
810 IF R#="S" THEN 820 ELSE 860
820 !\INPUT"DAME EL COEFICIENTE DE ALMACENAMIENTO <S> ",E(6)\!"
830 FOR I=1 TO N2
840 WRITE#OZI#40+25,E(6),NOENDMARK
850 NEXT I GOTO 900
860 !\!"ENTRAN ELEMENTO Y COEFICIENTE DE ALMACENAMIENTO"\!"ELEM COEF"\!"\FOR I=1 TO N2
870 INPUT1","E\!TAB(8),\INPUT","E(6)
880 WRITE#OZI#40+25,E(6),NOENDMARK
890 NEXT I
900 !\!"Es constante la recarga? ",\R#="INCHAR$(0)\!"
910 IF R#="S" THEN 920 ELSE 960
920 !\INPUT"DAME LA RECARGA ",E(7)\!"
930 FOR I=1 TO N2
940 WRITE#OZI#40+30,E(7),NOENDMARK
950 NEXT I GOTO 1000
960 !\!"ENTRAN ELEMENTO Y RECARGA"\!"ELEM RECARGA"\!"\FOR I=1 TO N2
970 INPUT1","E\!TAB(7),\INPUT","E(7)
980 WRITE#OZE#40+30,E(7),NOENDMARK
990 NEXT I
1000 !\!"ENTRAN NODO Y GASTO DE ENTRADA O SALIDA <+ o ->"\!"NODO GASTO"\!"
1010 FOR I=1 TO N1
1020 INPUT1","N\!TAB(8),\INPUT","W
1030 WRITE#I#N#65+60,W,NOENDMARK
1040 NEXT I
1050 !\!"ENTRAN ELEMENTO Y ESPESOR SATURADO"\!"ELEM ESPESOR"\!"
1060 GOTO 1110
1070 FOR I=1 TO N2
1080 INPUT1","E\!TAB(9),\INPUT","E(9)
1090 WRITE#OZE#40+35,E(9),NOENDMARK
1100 NEXT I
1110 !#Q\!#Q
1120 !#Q" ELEM",TAB(09),"I",TAB(14),"J",TAB(19),"K",TAB(27),"Tx",TAB(37),"Ty",TAB(47),"S",TAB(57),"N",TAB(67),"B"\!#Q
1130 FOR I=1 TO N2
1140 READ#OZI#40,E(1),E(2),E(3),E(4),E(5),E(6),E(7),E(8)
1150 !#QZ5I,I,E(1),E(2),E(3),Z10F4,E(4),E(5),E(6),E(7),E(8)
1160 NEXT I
1170 !#Q\!#Q\!#Q
1180 !#Q" NODO LE RODEAN LOS ELEMENTOS:",TAB(51),"X",TAB(61),"Y",TAB(71),"W"\!#Q
1190 FOR I=1 TO N1+NG
1200 READ#I#I#65,N(1),N(2),N(3),N(4),N(5),N(6),N(7),N(8),N(9),N(10),N(11),N(12),N(13)
1210 !#QZ4I,I,N(1),N(2),N(3),N(4),N(5),N(6),N(7),N(8),N(9),N(10),Z10F2,N(11),N(12),N(13)
1220 NEXT I
1230 !#Q\!#Q\!#Q
1240 R1=5*(N1+N3+1)
1250 FOR L=1 TO N1
1260 S2=0\!S3=0
1270 READ#I#L#65+60,W
1280 READ#I#L#65,N(1),N(2),N(3),N(4),N(5),N(6),N(7),N(8),N(9),N(10)
1290 FOR V=1 TO 10
1300 IF N(V)=0 THEN EXIT 1600
1310 READ#OZN(V)#40,F1,F2,F3,T1,T2,S,N,B
1320 IF L=F1 THEN 1330 ELSE 1350
1330 I=F1\!J=F2\!K=F3
1340 GOTO 1390
1350 IF L=F2 THEN 1360 ELSE 1380
1360 I=F2\!J=F3\!K=F1
1370 GOTO 1390
1380 I=F3\!J=F1\!K=F2
1390 READ#I#L#65+50,X1,Y1
1400 READ#I#L#65+50,X2,Y2

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1410 READ#1ZK*65+50, X3, Y3
1420 A=ABS(((X2*Y3)+(X1*Y2)+(X3*Y1)-(X2*Y1)-(X3*Y2)-(X1*Y3)))/2
1430 L1=(Y2-Y3)*(Y2-Y3)/(4*A)
1440 L2=(Y3-Y1)*(Y2-Y3)/(4*A)
1450 L3=(Y1-Y2)*(Y2-Y3)/(4*A)
1460 M1=(X3-X2)*(X3-X2)/(4*A)
1470 M2=(X1-X3)*(X3-X2)/(4*A)
1480 M3=(X2-X1)*(X3-X2)/(4*A)
1490 L4=L1+M1*T2
1500 L5=L2+M2*T2
1510 L6=L3+M3*T2
1520 S2=S2+A*N/3
1530 READ#2ZL*R1+(5*(I-1)),B1
1540 WRITE#2ZL*R1+(5*(I-1)),B1+L4,NOENDMARK
1550 READ#2ZL*R1+(5*(J-1)),B2
1560 WRITE#2ZL*R1+(5*(J-1)),B2+L5,NOENDMARK
1570 READ#2ZL*R1+(5*(K-1)),B3
1580 WRITE#2ZL*R1+(5*(K-1)),B3+L6,NOENDMARK,,
1590 NEXT V
1600 S2=S2*W
1610 WRITE#2ZL*R1+(5*(N1+N3)),S2 ,NOENDMARK
1620 NEXT L
1630 FOR I=1 TO N1
1640 FOR J=N1+1 TO N1+N3
1650 READ#2ZI*R1+5*(J-1),A1
1660 WRITE#2ZI*R1+5*(J-1),O,NOENDMARK
1670 READ#2ZJ*R1+5*(N1+N3),B1
1680 READ#2ZJ*R1+5*(N1+N3),U
1690 WRITE#2ZJ*R1+5*(N1+N3),B1-A1*U,NOENDMARK
1700 NEXT J
1710 NEXT I
1720 !#Q\!#Q"MATRIZ A RESOLVER"!#Q
1730 FOR I=1 TO N1+N3\FOR J=1 TO N1+N3+1\READ #2ZI*(5*(N1+N3)+5)*(J-1),A\!#QTAB(10*(J-1)),X09E2,A,\NEXTJ\!#Q\NEXT I
1740 R1=5*(N1+N3+1)
1750 FOR I=1 TO N1
1760 READ#2ZI*R1+5*(I-1),P
1770 FOR J=1 TO N1+N3+1
1780 READ#2ZI*R1+5*(J-1),A
1790 WRITE#2ZI*R1+5*(J-1),A/P,NOENDMARK
1800 NEXT J
1810 FOR K=1 TO N1
1820 IF K=I THEN 1900
1830 READ#2ZK*R1+5*(I-1),C
1840 FOR J=1 TO N1+N3+1
1850 READ#2ZK*R1+5*(J-1),B
1860 READ#2ZK*R1+5*(J-1),A
1870 D=B-C*A
1880 WRITE#2ZK*R1+5*(J-1),D,NOENDMARK
1890 NEXT J
1900 NEXT K
1910 NEXT I
1920 !#Q\!#Q"!#Q
1930 !#Q"MATRIZ SOLUCION"!#Q
1940 FOR I=1 TO N1+N3\FOR J=1 TO N1+N3+1\READ #2ZI*(5*(N1+N3)+5)*(J-1),A\!#QTAB(10*(J-1)),X09E2,A,\NEXTJ\!#Q\NEXT I

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