

#CONTROL USLINIT,CROSSREF,LABEL
PROGRAM DH205

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C*****
C
C CURRAGH RESOURCES
C
C*****
C PROGRAM DH205
C-----
C*****
C MAIN PROGRAM IN DIAMOND DRILL HOLE DATA BASE SYSTEM.
C
C DESIGNED AND PROGRAMMED BY
C JIM MARLON-LAMBERT
C ICAS SOFTWARE SERVICES INC.
C
C LEE PIGAGE
C CURRAGH RESOURCES
C
C VERSION 1.0 AUGUST 1988.
C
C*****
C CHANGE DATABASE NAME FOR EACH DATABASE
C*****
C PROGRAM DH205 DOWNLOADS THE HEADER, DOWNHOLE SURVEY,
C LITHOLOGY, AND ASSAY DATA TO AN ASCII FILE
C*****
C INITIALIZE PROGRAM AND SET CONSTANTS
C
C 'DRILL-HOLE' MASTER DATA SET
C-----
C COMMON /DHMSTR/ DDHIDM,UTMCS(3),TOTALD,SECTION,RFE,IRDIR,
1 MPLNGE(2),INDDDM,DUTMS(3),GEOLCS(3),
2 DDHBOX(6),INDSSM
C CHARACTER*8 DDHIDM, SECTION
C CHARACTER*2 RFE
C DOUBLE PRECISION DUTMS,DDHBOX
C
C
C 'LITHOLOGIES' DETAIL DATA SET
C-----
C COMMON /DHLITH/ DDHIDL,TDEPTH,ILITHU,CLITH,DLITH,RECOV,
1 INDDDL,DDZL(3)
C CHARACTER DDHIDL*8,CLITH*8,DLITH*30
C
C
C 'ORE SAMPLES & ASSAYS' DETAIL DATA SET
C-----
C COMMON /DDHSAM/ DDHIDN,JSAMPL,LITHCD,ASLAB,ASCERT,NASC,
1 FDPHTA,TDPHTA,SRECOV,ASSAYS(20),
2 INDDDS,DD1S(3),DD2S(3),UTMS(3)
C CHARACTER DDHIDN*8,ASLAB*10,ASCERT*8,LITHCD*8
C INTEGER*4 JSAMPL
C DOUBLE PRECISION UTMS
C
C

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C      'DOWN-HOLE SURVEYS' DETAIL DATA SET
C
C      COMMON /DDHSUR/ DDHIDZ,SDEPTH,ZENITH,AZMUTH
C      CHARACTER DDHIDZ*8
C
C      BLOCK CONTAINING ALL SURVEY DATA FOR A HOLE
C-----
C      COMMON /SURVBLK/ NSURRECS,SURVDATA(3,100)
C
C      COMMON /PDATA/ PDATA(30,150),CBDATA(150)
C
C      CHARACTER*72 CHUNIT, CH72, BUFFER
C      CHARACTER*38 LITH1 , LITH2(300)
C      CHARACTER*5 CH05,LITH
C
C      CHARACTER DHNAMES*8(500)
C      CHARACTER*2 CH02
C      CHARACTER*8 DDHID,CH08,CBDATA,PCMINE
C
C      CHARACTER*50 TITLE(3)
C      CHARACTER*1 CH01, BELL, APOS
C      CHARACTER*6 SYSTEM,PRGRAM
C      DIMENSION JSORT(300) , DPLITH(300) , LITPTR(300)
C      REAL MN
C      INTEGER*4 NCHAIN,JSORT
C
C      PI = 3.1415926
C      CHUNIT = " "
C      CH72 = " "
C      BELL = ""
C      NUMREC = 0
C      APOS = ""
C      PCMINE = "PCMINEDH"
C
C*****
C
C      IZ = 49
C      TITLE(1) = "      CREATION OF DIAMOND DRILL HOLE DATA FILES "
C      TITLE(2) = "      FOR INPUT TO PCMINE SYSTEM. "
C      TITLE(3) = "      (UNIVERSAL MODEL - AUGUST 1988) "
C      SYSTEM = "DDHDB "
C      PRGRAM = "DH205 "
C      DISPLAY " *****"
C      DISPLAY " * * "
C      DISPLAY " * PROGRAM DH205 * "
C      DISPLAY " * * "
C      DISPLAY " *****"
C      DISPLAY " "
C      DISPLAY TITLE(1)
C      DISPLAY TITLE(2)
C      DISPLAY TITLE(3)
C      DISPLAY " "
C
C      OPEN LINE PRINTER FOR OUTPUT AS UNIT FTN09
C
C      BUFFER = "FILE FTN09;DEV=LP,8;REC=-132,,F,ASCII;CCTL ."
C      BUFFER[43:1] = %15C
C      CALL COMMAND(BUFFER,IERR,IPARM)
C      IF (.CC.) 10 , 20 , 10
10  DISPLAY " UNABLE TO OPEN LINE PRINTER FOR PRINTED OUTPUT"
C      DISPLAY " DH205PR RUN TERMINATED ***"
C      STOP
C

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20 CONTINUE 00132000
C 00133000
C PURGE ANY EXISTING PCMINE OUTPUT DATA FILE (FTN10) 00134000
C 00135000
  BUFFER = "PURGE PCMINEDH " 00136000
  BUFFER[15:1] = %15C 00137000
  CALL COMMAND(BUFFER,IERR,IPARM) 00138000
  IF (.CC.) 40,30,40 00139000
30 DISPLAY " *EXISTING 'PCMINE' FILE PURGED* " 00140000
C 00141000
C CREATE PCMINE OUTPUT DATA FILE (FTN10) 00142000
C 00143000
40 CONTINUE 00144000
  BUFFER = "BUILD PCMINEDH;DISC=40000,1,1;REC=-72,3,F,ASCII " 00145000
  BUFFER[48:1] = %15C 00146000
  CALL COMMAND(BUFFER,IERR,IPARM) 00147000
  IF (.CC.) 50,60,50 00148000
C 00149000
50 DISPLAY " * UNABLE TO BUILD NEW 'PCMINE' DATA FILE *" 00150000
  DISPLAY " *** DH205PR RUN TERMINATED ***" 00151000
  STOP 00152000
C 00153000
60 DISPLAY " * NEW 'PCMINE' DATA FILE BUILT =",PCMINE 00154000
  BUFFER = "FILE FTN10=PCMINEDH,OLD " 00155000
  BUFFER[24:1] = %15C 00156000
  CALL COMMAND(BUFFER,IERR,IPARM) 00157000
  IF (.CC.) 70,80,70 00158000
C 00159000
70 DISPLAY " * UNABLE TO ASSIGN NEW 'PCMINE' DATA FILE *" 00160000
  DISPLAY " *** DH205PR RUN TERMINATED ***" 00161000
  STOP 00162000
C 00163000
80 CONTINUE 00164000
C 00165000
C*****00166000
C PRINT REPORT TITLE PAGE 00167000
C 00168000
  NTITLE = 3 00169000
  CALL LTITLE(SYSTEM,PROGRAM,NTITLE,TITLE) 00170000
  INXT = 0 00171000
  IUSER = 20 00172000
  MODE = 3 00173000
  NLPP = 40 00174000
  NLINE = 40 00175000
C 00176000
C*****00177000
C OPEN 'DDHDB.ANVIL' DATA BASE. 00178000
C 00179000
  BUFFER = "FILE DDHDB=DDHDB.ANVIL.GEOLOGY " 00180000
  BUFFER[31:1] = %15C 00181000
  CALL COMMAND(BUFFER,IERR,IPARM) 00182000
  IF (.CC.) 90,95,90 00183000
C 00184000
90 DISPLAY " * UNABLE TO ASSIGN 'ANVIL' DDHDB *" 00185000
  DISPLAY " *** DH205PR RUN TERMINATED ***" 00186000
  STOP 00187000
C 00188000
95 CALL DH700(IUSER,MODE) 00189000
C 00190000
C*****00191000
C 00192000
C GET ALL THE DRILL HOLE MASTERS 00193000
C ----- 00194000
C 00195000
  CALL DH712(DHNAME,500,IRTRN) 00196000
  NDHOLES = IRTRN 00197000

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DISPLAY " NUMBER OF DDH IN DBASE = ",NDHOLES
C
C*****
C
C SELECT THE DRILL HOLE
C
C DO 999 IH = 1,NDHOLES
C     NSUR = 0
C     NSURRECS = NSUR
C     NSAM = 0
C     NLITH = 0
C     NLREC = 1
C
C*****
C GET DDHID MASTER RECORD FOR HEADER INFORMATION
C
C     DDHID = DHNAMES(IH)
C     CH01 = DDHID[1:1]
C
C GO TO NEXT DRILL HOLE IF DDHID = "*****"
C     IF (CH01 .EQ. "*") GOTO 999
C
C     CALL DH710(DDHID,IRTRN)
C     IF (IRTRN.EQ.0) GO TO 110
C     GO TO 999
110 CONTINUE
C
C     DDHID = DDHIDM
C     DHUTMN = UTMCS(1)
C     DHUTME = UTMCS(2)
C     DHUTML = UTMCS(3)
C     TOTDDH = TOTALD
C
C     CALL LPAGE
C     WRITE(9,9530) DDHIDM,DHUTMN,TOTDDH,DHUTME,DHUTML
9530 FORMAT(/,4X,"DDH= ",A8,3X,"COLLAR COORDINATES = ",F10.1,
1     "MINE-N",5X,"TOTAL-DEPTH = ",F6.1,/,
2     9X,7(1H*),26X,F10.1," MINE-E",/,42X,F10.1," MINE-EL",/ )
C
C*****
C SEARCH RECORD CHAIN FOR 'DDHID' DOWN-HOLE SURVEYS.
C
C     CALL DH716(DDHID,NCHAIN,IRTRN)
C     IF (IRTRN.EQ.0) GO TO 201
C     DISPLAY " *** PROBLEM *** NO SURVEYS FOUND FOR DDH =",DDHID
C     WRITE(9,9801) DDHID
9801 FORMAT(/,5X,"*** PROBLEM *** NO SURVEYS FOUND FOR DDH =",A8)
C     GO TO 999
C
C     IXSUR = NCHAIN
C     DISPLAY IXSUR,"DOWN-HOLE SURVEYS FOUND FOR DDH =",DDHID
C     WRITE(9,9531) IXSUR,DDHID
9531 FORMAT(/,15X,I4," DOWN-HOLE SURVEYS FOUND FOR DDH = ",A8)
C
C READ ALL SURVEY RECORDS FOR DRILL HOLE FROM DATABASE
C
C     CALL DH717(IRTRN)
C     IF (IRTRN.NE.0) GO TO 250
C     NSUR = NSUR +1
C     SURVDATA(1,NSUR) = SDEPTH
C     SURVDATA(2,NSUR) = ZENITH
C     SURVDATA(3,NSUR) = AZMUTH
C     GO TO 210
210
C

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C	SORT DOWN-HOLE SURVEY DATA INTO ORDER	00264000
C		00265000
250	CALL DH800(SURVDATA,1,NSUR)	00266000
	NSURRECS = NSUR	00267000
C		00268000
	CALL LPAGE	00269000
	WRITE(9,95340)	00270000
95340	FORMAT(5X,"DOWN-HOLE SURVEY DATA RETRIEVED FROM DATA BASE",	00271000
1	/,5X,46(1H*),//,5X,"DEPTH",5X,"ZENITH",4X,"AZIMUTH")	00272000
C		00273000
	DO 255 I=1,NSUR	00274000
	WRITE(9,9534) (SURVDATA(J,I),J=1,3)	00275000
9534	FORMAT(4X,F6.1,6X,F5.1,5X,F5.1)	00276000
255	CONTINUE	00277000
C		00278000
C	*****	00279000
C		00280000
C	SEARCH RECORD CHAIN FOR 'DDHID' LITHOLOGIES	00281000
C		00282000
300	CALL DH726 (DDHID,NCHAIN,IRTRN)	00283000
	IF (NCHAIN .NE. 0) GO TO 310	00284000
	IXLITH = 1	00285000
	LITH2(IXLITH) = "NO LITHOLOGIES	" 00286000
	LITPTR(IXLITH) = 1	00287000
	NLREC = 0	00288000
	DPLITH(IXLITH) = TOTDDH	00289000
	NLITH = 1	00290000
	GO TO 320	00291000
C		00292000
310	IXLITH = NCHAIN	00293000
	NLREC = NCHAIN	00294000
C		00295000
320	DISPLAY NLREC, " LITHOLOGY UNITS FOUND FOR DDH = ", DDHID	00296000
	WRITE (9,9080) NLREC, DDHID	00297000
9080	FORMAT (/4X,I4," LITHOLOGY UNITS FOUND FOR DDH = ", A8)	00298000
C		00299000
C	RETRIEVE AND STORE THESE UNITS WITH THEIR LITH CODES	00300000
C		00301000
	IF (NLREC .EQ. 0) GO TO 340	00302000
	DO 330 IX=1,IXLITH	00303000
	CALL DH727(IRTRN)	00304000
	IF (IRTRN .NE. 0) GO TO 330	00305000
	NLITH = NLITH + 1	00306000
	LITH1 = "	" 00307000
	LITH1(1:8) = CLITH	00308000
	LITH1(9:30) = DLITH	00309000
	LITH2(NLITH) = LITH1	00310000
	DPLITH(NLITH) = TDEPTH	00311000
	LITPTR(NLITH) = NLITH	00312000
330	CONTINUE	00313000
C		00314000
C	SORT LITHOLOGY UNITS INTO ORDER	00315000
C		00316000
	CALL DH804(JSORT,DPLITH,LITPTR,1,NLITH)	00317000
340	CONTINUE	00318000
C		00319000
C	*****	00320000
C		00321000
C	SEARCH RECORD CHAIN FOR 'DDHID' SAMPLES..	00322000
C		00323000
400	CALL DH741(DDHID,NCHAIN,IRTRN)	00324000
C		00325000
	IXSN = NCHAIN	00326000
	DISPLAY IXSN," SAMPLES FOUND FOR DDH = ",DDHID	00327000
	WRITE(9,9535) IXSN,DDHID	00328000
9535	FORMAT(/,4X,I4," SAMPLES FOUND FOR DDH = ",A8)	00329000

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C      IF (NCHAIN .NE. 0) GO TO 420
C
C      FOR NO ASSAY SAMPLES
C
C      FROM1 = 0.0
C      T01 = TOTDDH
C      CALL WASTE(NSAM, FROM1, T01)
C      GOTO 470
C
C 420      CONTINUE
C
C      LIST AND STORE THESE SAMPLES WITH THEIR ASSAYS.
C
C
C      DO 450 IX=1, IXSN
C          CALL DH742(IRTRN)
C          IF (IRTRN.NE.0) GO TO 450
C
C          NSAM = NSAM+1
C
C          FDEPTH = FDPHTA
C          TDEPTH = TDPHTA
C          RECOV = SRECOV
C
C          PDATA(1, NSAM) = FDEPTH
C          PDATA(2, NSAM) = TDEPTH
C          PDATA(3, NSAM) = RECOV
C
C          CBDATA(NSAM) = LITHCD
C
C          PDATA(4, NSAM) = 0.0
C          PDATA(5, NSAM) = JSAMPL
C          PDATA(6, NSAM) = 0.0
C          PDATA(7, NSAM) = 0.0
C          PDATA(8, NSAM) = 0.0
C          PDATA(9, NSAM) = 0.0
C          PDATA(10, NSAM) = 0.0
C
C          DO 440 IA=1, 20
C              IP = IA + 10
C              PDATA(IP, NSAM) = ASSAYS(IA)
C          CONTINUE
C
C 440      CONTINUE
C
C 450      CONTINUE
C
C      SORT SAMPLE DATA INTO DOWN-HOLE ORDER.
C
C      IF (NSAM.LE.1) GO TO 452
C      CALL DH492(PDATA, CBDATA, 1, NSAM)
C
C 452      CONTINUE
C
C      INSERT WASTE INTERVALS
C
C      T01 = 0.0
C      DO 460 IX = 1, IXSN
C          FDEPTH = PDATA(1, IX)
C          IF (ABS(T01-FDEPTH) .LE. 0.01) GOTO 455
C          CALL WASTE(NSAM, T01, FDEPTH)
C          T01 = PDATA(2, IX)
C
C 455      CONTINUE
C
C          IF ((TOTDDH - T01) .GE. 0.01) CALL WASTE(NSAM, T01, TOTDDH)
C
C      SORT SAMPLE DATA INTO DOWN-HOLE ORDER AGAIN
C
C

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sample #

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IF (NSAM .LE. 1) GOTO 470
CALL DH492(PDATA,CBDATA,1,NSAM)
C
470 CONTINUE
C
C*****
C
C GENERATION OF DDH OUTPUT RECORDS.
C .....
C
CALL LPAGE
WRITE(9,9536)
9536 FORMAT(/,4X,"SAMPLE DATA RECORDS",/,4X,19(1H-))
C
C FIRST RECORD. - COLLAR DATA
C
WRITE(10,9100)
9100 FORMAT ("*")
WRITE(10,9110) APOS, DDHID, APOS
9110 FORMAT (A1,A8,A1)
WRITE (10,9120) APOS, APOS
9120 FORMAT (A1, "DDH", A1)
WRITE (10, 9125) DHUTMN, DHUTME, DHUTML, TOTDDH
9125 FORMAT (4F15.3)
C
C WRITE DOWNHOLE SURVEY DATA TO OUTPUT FILE
C
WRITE (10,9130) NSUR
DO 810 IX = 1,NSUR
WRITE (10,9170) (SURVDATA(J,IX),J=1,3)
9170 FORMAT(3F8.1)
810 CONTINUE
C
C WRITE LITHOLOGIES TO OUTPUT FILE
C
WRITE (10, 9130) NLITH
TDEPTH = 0.0
9130 FORMAT (15)
DO 500 I = 1, NLITH
FDEPTH = TDEPTH
TDEPTH = DPLITH(I)
KPTR = LITPTR(I)
WRITE (10,9140) FDEPTH, TDEPTH, APOS, LITH2(KPTR),APOS
9140 FORMAT (2(2X,F6.1),5X,A1,A38,A1)
500 CONTINUE
C
C WRITE ASSAY SAMPLES TO OUTPUT FILE
C
WRITE (10,9130) NSAM
DO 800 I = 1, NSAM
FROM = PDATA(1,I)
TO = PDATA(2,I)
RECOV = PDATA(3,I)
JSAMPL = PDATA(5,I)
CHOB = CBDATA(I)
DUMMY = -1.0
PB = DUMMY
ZN = DUMMY
AGAA = DUMMY
CUAA = DUMMY
AU = DUMMY
SG = DUMMY
WRSB = DUMMY
PY = DUMMY
PO = DUMMY
TOTFE = DUMMY

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BAO = DUMMY
MN = DUMMY
HG = DUMMY
AS = DUMMY
PBZN = DUMMY
BA = DUMMY

C
IF (PDATA(13,I).LE. 0.00) GO TO 610
PB = PDATA(13,I)

C
610
IF (PDATA(14,I).LE.0.00) GO TO 620
ZN = PDATA(14,I)

C
620
FA IF (PDATA(16,I).LE.0.00) GO TO 630
AA ~~AG = PDATA(16,I)~~ ~~GO TO 640~~
AA ~~AG = PDATA(16,I)~~ *GO TO 640*
IF (PDATA(15,I).GT.0.0) *FA* AG = PDATA(15,I)
AA ~~AG = PDATA(15,I)~~

C
630
IF (PDATA(12,I).LE.0.00) GO TO 650
CU = PDATA(12,I)

C
640

C
650
IF (PDATA(17,I).LE.0.00) GO TO 660
AU = PDATA(17,I)

C
660
IF (PDATA(11,I).LE.0.00) GO TO 670
SB = PDATA(11,I)

C
670
IF (PDATA(19,I).LE.0.00) GO TO 680
PY = PDATA(19,I)

C
680
IF (PDATA(18,I).LE.0.00) GO TO 690
PD = PDATA(18,I)

C
690
IF (PDATA(20,I).LE.0.00) GO TO 700
BAO = PDATA(20,I)

C
700
IF (PB.LT.0.0.AND.ZN.LT.0.0) GO TO 730
IF (PB.GT.0.0.AND.ZN.GT.0.0) GO TO 720
IF (PB.GT.0.0) GO TO 710
PBZN = ZN
GO TO 730
PBZN = PB
GO TO 730
PBZN = PB +ZN

C
710

C
720

C
730
IF (PDATA(21,I).LE.0.00) GO TO 740
HG = PDATA(21,I)

C
740
IF (PDATA(22,I).LE.0.00) GO TO 750
MN = PDATA(22,I)

C
750
IF (PDATA(23,I).LE.0.00) GO TO 760
AS = PDATA(23,I)

C
760
IF (PDATA(24,I).LE. 0.00) GO TO 762
BA = PDATA(24,I)

C
762
IF (PDATA(30,I).LE. 0.00) GO TO 764
WRSG = PDATA(30,I)

C
764
IF (PD.LT.0.0.AND.PY.LT.0.0) GO TO 790
IF (PD.GT.0.0.AND.PY.GT.0.0) GO TO 780
IF (PD.GT.0.0) GO TO 770
TOTFE = PY
GO TO 790
TOTFE = PD

C
770

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00483000
00484000
00485000
00486000
00487000
00488000
00489000
00490000
00491000
00492000
00493000
00494000
00495000
00496000
00497000
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00499000
00500000
00501000
00502000
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00516000
00517000
00518000
00519000
00520000
00521000
00522000
00523000
00524000
00525000
00526000
00527000

```

780      GO TO 790
790      TOTFE = PD +PY
      CONTINUE
C
      WRITE (10,9150) FROM,TO,RECOV,PB,ZN,AG,AU,CU,SG(WRSG)
9150     FORMAT (2F8.1,F6.1,2F6.2,F6.1,2F6.2,F6.2)
      WRITE (10,9160) PY,PO,TOTFE,BAO,BA,MN,HG,AS,PBZN(CHOB)
9160     FORMAT (6F6.2,F7.3,2F6.2,2X(AB)
      WRITE (10,9180) JSAMPL
9180     FORMAT (I10)
C      (AB,2X,I10)
800      CONTINUE
C
C      LOOP BACK FOR NEXT DRILL HOLE
999     CONTINUE
C
C*****
C      CLOSE 'DDHDB.ANVIL' DATA BASE
C
1000    CALL DH799
      ENDFILE 10
      REWIND 10
C
      STOP
      END
C
C*****
C#####
C#####
C#####
C
      SUBROUTINE WASTE(NSAM,FROM,TO)
C
C      THIS SUBROUTINE CREATES A "DUMMY" ASSAY SAMPLE FOR WASTE INTERVALS
C
      COMMON /PDATAC/PDATA(30,150),CBSDATA(150)
      CHARACTER*8 CBSDATA
C
      NSAM = NSAM + 1
      CBSDATA(NSAM) = "WASTE "
      PDATA(1,NSAM) = FROM
      PDATA(2,NSAM) = TO
      DO 100 IX = 1, 30
          PDATA(IX,NSAM) = 0.0
100     CONTINUE
      RETURN
      END
C
C*****
C#####
C
      SUBROUTINE DH804(A,B,C,II,JJ)
C
C      SORTS ARRAY A INTO INCREASING ORDER, FROM A(II) TO A(JJ)
C      ORDERING IS BY INTEGER SUBTRACTION, THUS FLOATING POINT
C      NUMBERS MUST BE IN NORMALIZED FORM.
C      ARRAYS IU(K) AND IL(K) PERMIT SORTING UP TO 2**((K+1)-1) ELEMENTS
C      NOTE - THIS ROUTINE SORTS AN INTEGER*4 ARRAY (A) INTO
C      ASCENDING ORDER AND CARRIES ONE REAL ARRAY (B)
C      AND ONE INTEGER ARRAY (C) ON THE HP3000 COMPUTER
C
      DIMENSION IU(16) , IL(16)
      DIMENSION B(1)
      INTEGER C(1), TC, TTC
      INTEGER*4 A(1),T,TT
C
      NORMALIZE SORT KEY (A FROM B)
C

```

AA,AGFA
next write
next write

[K
C]

leave as is for Fire assay A difference

change to 3

100

```

DO 700 I = II, JJ
      A(I) = B(I) * 100.0
700 CONTINUE
C
      M = 1
      I = II
      J = JJ
5     IF(I .GE. J) GOTO 70
10    K = I
      IJ = (J + I) / 2
      T = A(IJ)
      TB = B(IJ)
      TC = C(IJ)
      IF(A(I) .LE. T) GOTO 20
      A(IJ) = A(I)
      B(IJ) = B(I)
      C(IJ) = C(I)
      A(I) = T
      B(I) = TB
      C(I) = TC
      T = A(IJ)
      TB = B(IJ)
      TC = C(IJ)
20    L = J
      IF(A(J) .GE. T) GOTO 40
      A(IJ) = A(J)
      B(IJ) = B(J)
      C(IJ) = C(J)
      A(J) = T
      B(J) = TB
      C(J) = TC
      T = A(IJ)
      TB = B(IJ)
      TC = C(IJ)
      IF(A(I) .LE. T) GOTO 40
      A(IJ) = A(I)
      B(IJ) = B(I)
      C(IJ) = C(I)
      A(I) = T
      B(I) = TB
      C(I) = TC
      T = A(IJ)
      TB = B(IJ)
      TC = C(IJ)
30    GOTO 40
      A(L) = A(K)
      B(L) = B(K)
      C(L) = C(K)
      A(K) = TT
      B(K) = TTB
      C(K) = TTC
40    L = L - 1
      IF(A(L) .GT. T) GOTO 40
      TT = A(L)
      TTB = B(L)
      TTC = C(L)
50    K = K + 1
      IF(A(K) .LT. T) GOTO 50
      IF(K .LE. L) GOTO 30
      IF(L-I .LE. J-K) GOTO 60
      IL(M) = I
      IU(M) = L
      I = K
      M = M + 1
      GOTO 80
60    IL(M) = K

```

```

00593000
00594000
00595000
00596000
00597000
00598000
00599000
00600000
00601000
00602000
00603000
00604000
00605000
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00641000
00642000
00643000
00644000
00645000
00646000
00647000
00648000
00649000
00650000
00651000
00652000
00653000
00654000
00655000
00656000
00657000
00658000

```

```
    IU(M) = J
    J = L
    M = M + 1
    GOTO 80
70  M = M - 1
    IF(M .EQ. 0) RETURN
    I = IL(M)
    J = IU(M)
80  IF(J-I .GE. II) GO TO 10
    IF(I .EQ. II) GO TO 5
    I = I - 1
90  I = I + 1
    IF(I .EQ. J) GO TO 70
    T = A(I+1)
    TB = B(I+1)
    TC = C(I+1)
    IF(A(I) .LE. T) GO TO 90
    K = I
100 A(K+1) = A(K)
    B(K+1) = B(K)
    C(K+1) = C(K)
    K = K-1
    IF(T .LT. A(K)) GO TO 100
    A(K+1) = T
    B(K+1) = TB
    C(K+1) = TC
    GOTO 90
END
```

```
00659000
00660000
00661000
00662000
00663000
00664000
00665000
00666000
00667000
00668000
00669000
00670000
00671000
00672000
00673000
00674000
00675000
00676000
00677000
00678000
00679000
00680000
00681000
00682000
00683000
00684000
00685000
00687000
```

*
'65-53
'DDH'

	6605.399	14741.398	4019.800	427.000						
1	.0	180.0	.0							
5	.0	9.0	*							
	9.0	175.0	3D57							
	175.0	323.5	3D01							
	323.5	337.5	1D2							
	337.5	427.0	1D06							
1	.0	.0	.0	-1.00	-1.00	-1.0	-1.00	-1.00	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	WASTE
	0									

*not putting in
footage distances*

*
'65-55
'DDH'

	7035.300	15525.699	4009.400	233.000						
3	.0	180.0	85.0							
	100.0	177.2	85.0							
	200.0	175.4	85.0							
8	.0	113.0								
	113.0	148.0	1C0							
	148.0	150.0	10E27							
	150.0	159.0	1C0							
	159.0	163.0	080							
	163.0	190.0	1C0							
	190.0	200.0	1C8							
	200.0	233.0	1C0							
1	.0	.0	.0	-1.00	-1.00	-1.0	-1.00	-1.00	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	WASTE
	0									

*
'65006
'DDH'

	9599.600	14399.898	4099.800	500.000						
6	.0	179.3	37.0							
	100.0	178.2	37.0							
	200.0	177.1	37.0							
	300.0	176.0	37.0							
	400.0	174.9	37.0							
	500.0	173.7	37.0							
1	.0	500.0	'NO LITHOLOGIES							
42	.0	.0	.0	-1.00	-1.00	-1.0	-1.00	-1.00	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	WASTE
	0									
	.0	.0	.0	-1.00	-1.00	-1.0	-1.00	-1.00	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	WASTE
	0									
	284.0	290.0	.0	2.30	4.30	19.2	-1.00	.07	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	6.60	****	
	70004									
	290.0	295.0	.0	.40	5.40	30.2	-1.00	-1.00	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	5.80	****	
	70005									
	295.0	300.0	.0	1.10	4.00	30.9	-1.00	.07	-1.00	-1.00
	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	5.10	****	

top
2 samples
bottom

70006
300.0 305.0 .0 1.50 4.20 30.2 -1.00 .15 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 5.70 ****
70007
305.0 310.0 .0 2.50 7.60 80.9 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 10.10 ****
70008
310.0 315.0 .0 3.90 9.20 78.2 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 13.10 ****
70009
315.0 320.0 .0 2.10 4.10 12.3 -1.00 .07 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 6.20 ****
70010
320.0 325.0 .0 3.40 3.10 8.2 -1.00 .07 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 6.50 ****
70011
325.0 330.0 .0 1.70 1.60 8.2 -1.00 .16 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 3.30 ****
70012
330.0 335.0 .0 1.70 1.60 3.4 -1.00 .07 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 3.30 ****
70013
335.0 340.0 .0 -1.00 .70 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 .70 ****
70014
340.0 345.0 .0 .20 .20 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 .40 ****
70015
345.0 350.0 .0 3.90 3.20 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 7.10 ****
70016
350.0 355.0 .0 5.50 6.80 5.5 -1.00 .18 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 12.30 ****
70017
355.0 360.0 .0 2.30 2.70 6.8 -1.00 2.60 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 5.00 ****
70018
360.0 365.0 .0 .70 2.50 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 3.20 ****
70019
365.0 370.0 .0 4.40 2.60 13.7 -1.00 .22 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 7.00 ****
70020
370.0 375.0 .0 1.00 8.60 6.8 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 9.60 ****
70021
375.0 380.0 .0 1.60 4.40 12.3 -1.00 .27 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 6.00 ****
70022
380.0 385.0 .0 .50 .70 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 1.20 ****
70023
385.0 390.0 .0 6.40 11.80 6.8 -1.00 .18 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 18.20 ****
70024
390.0 395.0 .0 1.60 3.60 -1.0 -1.00 .37 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 5.20 ****
70025
395.0 400.0 .0 3.60 7.50 -1.0 -1.00 .30 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 11.10 ****
70026
400.0 405.0 .0 3.10 6.80 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 9.90 ****
70027
405.0 410.0 .0 4.70 9.60 8.2 -1.00 .07 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 14.30 ****

70028
410.0 415.0 .0 5.20 11.50 8.2 -1.00 .15 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 16.70 ****

70029
415.0 420.0 .0 4.60 9.80 6.8 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 14.40 ****

70030
420.0 425.0 .0 2.40 5.10 4.1 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 7.50 ****

70031
425.0 430.0 .0 3.70 8.20 6.8 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 11.90 ****

70032
430.0 435.0 .0 4.00 7.70 12.3 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 11.70 ****

70033
435.0 440.0 .0 4.30 9.60 2.7 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 13.90 ****

70034
440.0 445.0 .0 4.40 9.20 5.5 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 13.60 ****

70035
445.0 450.0 .0 3.60 7.10 17.8 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 10.70 ****

70036
450.0 455.0 .0 3.30 7.10 6.8 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 10.40 ****

70037
455.0 460.0 .0 2.10 3.80 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 5.90 ****

70038
460.0 465.0 .0 .40 1.10 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 1.50 ****

70039
465.0 470.0 .0 2.80 6.20 5.5 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 9.00 ****

70040
470.0 475.0 .0 3.00 7.50 13.7 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 10.50 ****

70041
475.0 480.0 .0 2.90 5.20 30.2 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 8.10 ****

70042
480.0 485.0 .0 .70 1.70 12.3 -1.00 .22 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 2.40 ****

70043

*
'65007
'DDH'
9999.600 14400.000 4130.800 500.000

6
.0 180.0 .0
100.0 178.9 37.0
200.0 178.3 37.0
300.0 177.1 37.0
400.0 176.0 37.0
500.0 174.9 37.0

1
.0 500.0 NO LITHOLOGIES

34
.0 .0 .0 -1.00 -1.00 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 -1.00 WASTE

0
.0 .0 .0 -1.00 -1.00 -1.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 -1.00 WASTE

.0
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 WASTE
0
146.0 150.0 .0 2.30 6.30 22.0 -1.00 .52 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 8.60 ****
70048
150.0 155.0 .0 .30 1.00 20.6 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 1.30 ****
70049
155.0 160.0 .0 1.40 4.20 6.9 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 5.60 ****
70050
160.0 165.0 .0 2.70 4.40 11.0 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 7.10 ****
70051
165.0 170.0 .0 2.10 5.70 18.5 -1.00 .37 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 7.80 ****
70052
185.0 190.0 .0 2.00 4.40 15.8 -1.00 .07 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 6.40 ****
70054
190.0 195.0 .0 2.30 8.50 15.1 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 10.80 ****
70055
195.0 200.0 .0 4.10 9.50 22.0 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 13.60 ****
70056
200.0 205.0 .0 2.40 5.30 22.0 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 7.70 ****
70057
205.0 210.0 .0 3.70 12.20 36.4 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 15.90 ****
70058
210.0 215.0 .0 2.80 7.60 26.1 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 10.40 ****
70059
215.0 220.0 .0 2.60 5.50 18.5 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 8.10 ****
70060
220.0 225.0 .0 1.80 11.10 27.4 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 12.90 ****
70061
225.0 235.0 .0 1.50 2.80 53.5 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 4.30 ****
70062
235.0 240.0 .0 3.90 5.00 11.0 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 8.90 ****
70063
240.0 245.0 .0 1.80 5.80 11.0 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 7.60 ****
70064
245.0 250.0 .0 2.30 7.80 19.2 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 10.10 ****
70065
250.0 255.0 .0 4.80 9.40 37.7 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 14.20 ****
70066
255.0 260.0 .0 1.60 5.50 13.0 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 7.10 ****
70067
260.0 265.0 .0 3.00 8.70 19.2 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 11.70 ****
70068

bottom

175-185
↗

265.0 270.0 .0 1.80 5.90 19.9 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 7.70 ****
70069
270.0 275.0 .0 3.60 9.70 34.3 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 13.30 ****
70070
275.0 280.0 .0 2.70 7.50 57.6 -1.00 -1.00 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 10.20 ****
70071
280.0 285.0 .0 2.10 6.00 19.2 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 8.10 ****
70072
285.0 290.0 .0 2.30 6.80 16.5 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 9.10 ****
70073
290.0 295.0 .0 .01 2.20 .1 -1.00 .15 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 2.21 ****
70074
295.0 300.0 .0 .60 2.50 8.2 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 3.10 ****
70075
330.0 335.0 .0 1.60 3.20 14.4 -1.00 .07 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 4.80 ****
70077
335.0 340.0 .0 1.70 4.90 20.6 -1.00 .18 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 6.60 ****
70078
340.0 345.0 .0 .20 2.00 8.2 -1.00 .01 -1.00 -1.00
-1.00 -1.00 -1.00 -1.00 -1.00 -1.00 -1.000 -1.00 2.20 ****
70079

370
630