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Wallenmeyer

MURA-600

IDENTIFICATION

READ DATA TAPE, MU RDT1
704 FORTRAN PROGRAM
G. A. Westlund - January 23, 1961
Midwestern Universities Research Association, Madison, Wisconsin

PURPOSE

To read numbers and loading addresses from BCD tape, convert the numbers to floating point, and store them in locations specified by the loading addresses.

METHOD

This program reads a BCD tape prepared from cards by the 1401 computer. (The 1401 program MU DCTT prepares such a tape.) Each tape record contains the information from one card. The tape records are at least 72 characters long (12 words).

This program does not rewind the input tape. It reads records until an end-of-file mark is sensed, or a record is read which contains blanks in character positions 1 and 2, but at least one non-blank character in positions 3-80 (e.g., the words END DATA in columns 37-44 of the original card).

An end of file mark causes MURDT1 to return control to the main program, the assumption being made that all necessary data for the program have been read.

One END DATA card (one in which columns 1 and 2 are blank and at least one column of 3-80 contains a punch) also causes MURDT1 to return control to the main program. A second END DATA card, following immediately after the first, results in a stop on an HPR instruction indicating that the data processing is complete. If the START button is pressed, MURDT1 will continue to read records and search for a "first" END DATA card. A series of runs is possible, but each block of data must be followed by a card of the END DATA type. A stop can occur only when two <u>successive</u> END DATA cards are read. Completely blank cards are normally ignored. An exception occurs when a blank card is read <u>immediately</u> after an END DATA card. This blank card is treated as a second END DATA card, causing a stop. The START button causes continuation as above.

If columns 1 or 2 of a card contains a punch it is treated as a data card (see DATA CARD FORMAT below). MURDT1 converts the values read into floating point numbers and stores them into locations of an array, where the locations

DISCLAIMER
Although this program has been carefully tested by its contributor, no guarantee is made of its correct functioning under all conditions, and no responsibility is taken by him in case of possible failure.

are specified by the loading addresses on the cards, and the array is specified by the FORTRAN CALLING SEQUENCE (see below). Conversion and storage continues as the columns are deciphered (from left to right on the card) until two blank columns are encountered in succession. MURDT1 then attempts to read the next record.

Since two successive blank columns signify the end of information for MURDT1, those columns following the two blanks can be used for comments(e.g., parameter name, card number, etc.).

If an illegally punched card (e.g., letters or symbols in columns meant to contain numeric information) is read, the remainder of the record is ignored.

DATA CARD FORMAT

At least one loading address and one value must be punched per data card. If more than one value is desired on a card, each value must be preceded by its own loading address (sequential loading addresses are <u>no</u> exception to this rule).

Starting in column one or two (column one may be left blank if desired), a loading address of from one to four digits is punched. Loading addresses must not be signed. A blank column follows this or any other loading address on a card. MURDT1 recognizes the blank as separating an address from a value. Next a value, consisting of a factor followed by an exponent, is punched. The value can be preceded by a plus or minus sign. If not signed, it is considered positive. A decimal point must precede or be contained within the factor part of the value, unless it is understood to follow the rightmost digit. The factor may not contain more than 8 digits. Exponents may be omitted if zero. If not, they must be signed, with no space between a factor and exponent. Exponents may not contain more than 2 digits.

If more than one value is desired on a card, each loading address must be separated from the previous value by a comma or a comma and a blank. As many addresses and values may be punched as will fit into columns 1-70 (two successive blanks are required to indicate the end of data on a card).

EXAMPLE:

```
1234 -567.89012+23, 4 567, 8 9-1, 2 3  COMMENTS
```

USAGE

MURDT1 is available on the FORTRAN II or SAP-FORTRAN tape at this installation. It is executed by means of the FORTRAN statement

```
CALL  DATA (N,X)
```

in the main program. N designates the tape number (1-10) from which the data is to be read. X is an array of locations to receive the values. A value with a loading address I is stored at location X(I). A loading address I = 0 is illegal, causing no storage. In the main program, X must have a dimension at least as large as the largest loading address to be encountered.

CODING INFORMATION

MURDT1 requires 206 words program space and 25 words temporary storage.

AGENDUM SHEETS

The standard MURA/FORTRAN agendum sheets are available at this installation for users of MURDT1. See attachment.

```
MURDT1 REM 0234 01251                                                   RDT10001
       FUL RDT1 - MURA READ DATA TAPE                                   RDT10002
       MZE 0,0,4                                                        RDT10003
       OCT 642167316345                                                 RDT10004
       HTR MZE+1                                                        RDT10005
       HTR COMMON                                                       RDT10006
       BCD 1DATA                                                        RDT10007
       REL                                                              RDT10008
       ORG 0                                                            RDT10009
DATA   SXD X1,1                                                         RDT10010
       SXD X2,2                                                         RDT10011
       SXD X4,4                                                         RDT10012
       CLA 1,4              LOC OF N                                    RDT10013
       STA *+1                                                          RDT10014
       CAL **               N                                           RDT10015
       ADD D128                                                         RDT10016
       ARS 18                                                           RDT10017
       STA B                                                            RDT10018
       CAL 2,4              X                                           RDT10019
       ADD H1                                                           RDT10020
       STA T                                                            RDT10021
A      LXD D24,1            CLEAR INDICATORS                            RDT10022
       STZ COMMON+24,1                                                  RDT10023
       TIX *-1,1,1                                                      RDT10024
B      RTD **               READ A RECORD                               RDT10025
       LXD D12,3                                                        RDT10026
       CPY COMMON+12,1                                                  RDT10027
X1     TXI *+2,0,**                                                     RDT10028
X2     TXI U,0,**           END OF FILE-EXIT                            RDT10029
       TIX *-3,1,1                                                      RDT10030
       IOD                                                              RDT10031
       CLA COMMON+12,2                                                  RDT10032
       SUB BLANKS                                                       RDT10033
       TNZ D                                                            RDT10034
       TIX *-3,2,1                                                      RDT10035
       CLS BBX                                                          RDT10036
       TMI A                IGNORE MOST BLANK CARDS,                    RDT10037
C      HPR 17               BUT STOP ON BLANK AFTER BBX                 RDT10038
       STO BBX                                                          RDT10039
X4     TXI A,0,**                                                       RDT10040
D      CAL COMMON           TEST FOR BBX CARD                           RDT10041
       ARS 24                                                           RDT10042
       SUB H3120                                                        RDT10043
       TNZ E                                                            RDT10044
       CLS BBX                                                          RDT10045
       TPL C                STOP ON SECOND BBX CARD                     RDT10046
       STO BBX              SET BBX IF FIRST                            RDT10047
D128   TXI U,0,128                                                      RDT10048
E      STZ BBX                                                          RDT10049
       LXD DZ,1             SET TO ADDRESS TIME                         RDT10050
       LXD D13,2                                                        RDT10051
       LXD D42,4                                                        RDT10052
       TIX *+1,2,1                                                      RDT10053
       SXD DEMP,2                                                       RDT10054
F      LXD DEMP,2           LOOK AT A CHARACTER                         RDT10055
       TNX *-4,4,6                                                      RDT10056
       LDQ COMMON+12,2                                                  RDT10057
       LGL 42,4                                                         RDT10058
       ANA CMSK                                                         RDT10059
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A1      PAX 1,2                                                 RDT10060
        CAS BLANK           TEST FOR BLANK                      RDT10061
D14     TXI *+2,0,14                                            RDT10062
DZ      TXI J,0,0                                               RDT10063
        STZ BLNK2           NOT BLANK-TURN BLNK2 OFF            RDT10064
        TXL K,2,9           TEST FOR 0-9                        RDT10065
        CAS COMMA           TEST FOR COMMA                      RDT10066
D13     TXI *+2,0,13                                            RDT10067
D42     TXI Q,0,42                                              RDT10068
        TXL A,1,0                                               RDT10069
        TXH A,1,1                                               RDT10070
        CAS MINUS           TEST FOR MINUS SIGN                 RDT10071
DEMP    TXI *+2,0,**                                            RDT10072
D12     TXI M,0,12                                              RDT10073
        CAS PERIOD          TEST FOR DECIMAL POINT              RDT10074
D6      TXI *+2,0,6                                             RDT10075
D24     TXI N,0,24                                              RDT10076
        CAS PLUS            TEST FOR PLUS SIGN                  RDT10077
D9      TXI *+2,0,9                                             RDT10078
        TRA F                                                   RDT10079
        TRA A                                                   RDT10080
J       TXH P,1,0           TEST FOR ADDRESS TIME               RDT10081
        CLS BLNK2           TEST BLNK2                          RDT10082
        TPL A               ON-NEXT RECORD                      RDT10083
        STO BLNK2           OFF-SET IT ON                       RDT10084
        CLS BLNK1           TEST BLNK1                          RDT10085
        TPL N-1             ON-ADVANCE TIME                     RDT10086
        STO BLNK1           OFF-SET IT ON                       RDT10087
        TRA F                                                   RDT10088
K       TXH *+4,1,0         TEST FOR ADDRESS TIME               RDT10089
        CLS *                                                   RDT10090
        STO BLNK1                                               RDT10091
        TRA L                                                   RDT10092
        CLS *                                                   RDT10093
        STO BLNK3                                               RDT10094
        TXH L,1,1           TEST FOR EXPONENT TIME              RDT10095
        CLS *                                                   RDT10096
        STO SIND                                                RDT10097
        CAL DIV             ADD ONE TO DIV                      RDT10098
        ADD H1                                                  RDT10099
        STA DIV                                                 RDT10100
        CLA DECPT                                               RDT10101
        TMI L               BRANCH IF PRIOR PERIOD              RDT10102
        CAL EXPA            ADD ONE TO EXPA                     RDT10103
        ADD H1                                                  RDT10104
        STA EXPA                                                RDT10105
L       LDQ NUMB,1          MULTIPLY NUMBER BY TEN              RDT10106
        MPY H10                                                 RDT10107
        STQ NUMB,1                                              RDT10108
        PXD 0,2             ADD THIS TO NUMBER                  RDT10109
        ARS 18                                                  RDT10110
        ACL NUMB,1                                              RDT10111
        SLW NUMB,1                                              RDT10112
        TRA F                                                   RDT10113
M       CLA SIND            TEST SIND                           RDT10114
        TMI *+4             ON                                  RDT10115
        CLS FRACT           OFF-SET FRACTION MINUS              RDT10116
        STO FRACT                                               RDT10117
        TRA F                                                   RDT10118
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        CLS EXP             SET EXPONENT MINUS                  RDT10119
        STO EXP                                                 RDT10120
        TXI F,1,1           ADVANCE TIME                        RDT10121
N       CLS *               SET DECPT ON                        RDT10122
        STO DECPT                                               RDT10123
        TRA F                                                   RDT10124
P       CLA BLNK3                                               RDT10125
        TPL A                                                   RDT10126
        STO BLNK2           YES-SET BLNK2 ON                    RDT10127
Q       CLA FRACT           FLOATING POINT CONVERSION           RDT10128
        SSP                                                     RDT10129
        TZE T-2                                                 RDT10130
        CLA EXP                                                 RDT10131
        ADD EXPA                                                RDT10132
        STO EXP                                                 RDT10133
        LXA DIV,1                                               RDT10134
        LDQ DIV                                                 RDT10135
        MPY H3                                                  RDT10136
        LLS 35                                                  RDT10137
        STA *+3                                                 RDT10138
        LDQ FRACT                                               RDT10139
        MPY BBX,1                                               RDT10140
        LRS **                                                  RDT10141
        STQ FRACT                                               RDT10142
        LDQ EXP                                                 RDT10143
        MPY LNLN                                                RDT10144
        LLS 2                                                   RDT10145
        ALS 27                                                  RDT10146
        STO EXP                                                 RDT10147
        MPR LN                                                  RDT10148
        LRS 2                                                   RDT10149
        STO EKS                                                 RDT10150
        STZ JAY                                                 RDT10151
        STZ SUM                                                 RDT10152
        CLA SXNTH                                               RDT10153
R       STO TEA                                                 RDT10154
        ADD SUM                                                 RDT10155
        STO SUM                                                 RDT10156
        CLA JAY                                                 RDT10157
        ADD H1                                                  RDT10158
        STO JAY                                                 RDT10159
        PXD 0,0                                                 RDT10160
        LDQ TEA                                                 RDT10161
        LLS 2                                                   RDT10162
        DVP JAY                                                 RDT10163
        MPR EKS                                                 RDT10164
        TNZ R                                                   RDT10165
        LDQ SUM                                                 RDT10166
        MPR FRACT                                               RDT10167
        LXA S,1                                                 RDT10168
        LLS 1                                                   RDT10169
        PBT                                                     RDT10170
        TXI *-2,1,-1                                            RDT10171
        LRS 9                                                   RDT10172
        SLW EKS                                                 RDT10173
S       PXD 132,1                                               RDT10174
        ALS 9                                                   RDT10175
        ADD EKS                                                 RDT10176
        ADD EXP                                                 RDT10177
```

```
        LDQ FRACT                                                       RDT10178
        LLS 0                                                           RDT10179
        LXA ADDR,1                                                      RDT10180
        TXL *+2,1,0                                                     RDT10181
T       STO **,1                                                        RDT10182
        LXD D9,1                                                        RDT10183
        STZ COMMON+24,1                                                 RDT10184
        TIX *-1,1,1                                                     RDT10185
        TXI F,1,-1                                                      RDT10186
U       LXD X1,1              EXIT                                      RDT10187
        LXD X2,2                                                        RDT10188
        LXD X4,4                                                        RDT10189
        TRA 3,4                                                         RDT10190
        OCT 052746167043                                                RDT10191
        OCT 065537624654                                                RDT10192
        OCT 103067572027                                                RDT10193
        OCT 123705530434                                                RDT10194
        OCT 150667056544                                                RDT10195
        OCT 203044672274                                                RDT10196
        OCT 243656050754                                                RDT10197
        OCT 314631463146                                                RDT10198
BBX     HTR **                                                          RDT10199
H1      HTR 1                                                           RDT10200
H3      HTR 3                                                           RDT10201
H10     HTR 10                                                          RDT10202
LNLN    OCT 324464741140                                                RDT10203
LN      OCT 261344137677                                                RDT10204
SXNTH   PZE 0,0,8192                                                    RDT10205
ZERO    HTR 0                                                           RDT10206
BLANKS  OCT 606060606060                                                RDT10207
H3120   HTR 3120                                                        RDT10208
CMSK    HTR 63                                                          RDT10209
BLANK   HTR 48                                                          RDT10210
COMMA   HTR 59                                                          RDT10211
MINUS   HTR 32                                                          RDT10212
PERIOD  HTR 27                                                          RDT10213
PLUS    HTR 16                                                          RDT10214
MZE     MZE 0                                                           RDT10215
COMMON  EQU -25                                                         RDT10216
BLNK2   EQU COMMON+14                                                   RDT10217
BLNK3   EQU COMMON+15                                                   RDT10218
SIND    EQU COMMON+16                                                   RDT10219
BLNK1   EQU COMMON+17                                                   RDT10220
DECPT   EQU COMMON+18                                                   RDT10221
DIV     EQU COMMON+19                                                   RDT10222
EXPA    EQU COMMON+20                                                   RDT10223
EXP     EQU COMMON+21                                                   RDT10224
FRACT   EQU COMMON+22                                                   RDT10225
ADDR    EQU COMMON+23                                                   RDT10226
NUMB    EQU ADDR                                                        RDT10227
EKS     EQU SIND                                                        RDT10228
JAY     EQU DECPT                                                       RDT10229
SUM     EQU DIV                                                         RDT10230
TEA     EQU EXPA                                                        RDT10231
BIT     EQU JAY                                                         RDT10232
TEMP    EQU TEA                                                         RDT10233
        END                                                             RDT10234
```

MURA/FORTRAN AGENDUM

PROGRAM NO. _____ SUBMITTER_____

Instructions:

1. Enter program number and submitter's name above.
2. Enter address and value below for parameters desired.
3. Enter sense switch settings: _____ _____ _____ _____ _____ _____

Notes:

1. Decimal points may be omitted only if understood to follow the rightmost digit.
2. Addresses may not contain more than 4 digits.
3. Factors may not contain more than 8 digits.
4. Exponents may not contain more than 2 digits.
5. Exponents may be omitted if zero. If not, they must be signed.

Address	Value		Address	Value		Address	Value	