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United States Department of the Interior

GEOLOGICAL SURVEY
Box 25046
Denver Federal Center
Denver, Colorado 80225

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U.S. Geological Survey
Open-file Report 80-756
by: J.S. Downey and E.J. Weiss

Press release

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PRELIMINARY COMPUTER INPUT DATA SET FOR DIGIT MODEL OF THE RED RIVER AND MADISON LIMESTONE AQUIFERS RELEASED

A preliminary, steady-state, three-dimensional finite-difference model of the hydrologic system above the Precambrian bedrock surface and below the Cretaceous units in the Northern Great Plains area is available as Open-File Report 80-756 from the U.S. Geological Survey, Department of the Interior.

The model consists of a computer readable data set that reflects the fresh water potentiometric surface, temperature adjusted transmissivity distribution, and permeability of confining beds. The model assumes constant density conditions; therefore, water quality data sets are not given. The Red River and Madison Limestone aquifers are represented as active hydrologic layers. Leakage between the aquifers and interaction with the Lower Cretaceous rocks is also simulated.

The model is available as punched cards or magnetic tape for input to the digital simulation model that has been released in U.S. Geological Survey open-file report 75-438.

The data set may be inspected at the U.S. Geological Survey, Room H2730, Building 53, Denver Federal Center, Denver, Colo. Arrangements may be made for duplication of the data set at the requestor's expense by writing to the Chief Hydrologist, U.S. Geological Survey, National Center, 12201 Sunrise Valley Drive, Mail Stop 950, Reston, Va. 22092.

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WRSIC ABSTRACT

Title: PRELIMINARY MACHINE READABLE DATA SET FOR THREE DIMENSIONAL DIGITAL MODEL OF THE RED RIVER AND MADISON LIMESTONE AQUIFERS.

Author: J. S. Downey, E. J. Weiss

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80 Character machine readable records: 573

Illustrations: 0

Tables: 0

References: 0

Method of release: Open file report number 80-756

Descriptors: *Simulation Model, *Hydrogeology, *Montana, Aquifer testing, North Dakota, Potential water supply, South Dakota, Wyoming.

Identifiers: *Madison Limestone, Northern Great Plains, Paleozoic age, Digital Model.

Abstract: The digital model of the Red River and Madison aquifers in parts of Montana, North and South Dakota, and Wyoming consists of a machine readable data set with an array size of 21 by 26 nodes that reflects the fresh water potentiometric surface, temperature adjusted transmissivity distribution, and permeability of confining beds. The rectangular finite difference grid used for this model is orientated northwest to southeast with a variable grid spacing. Using the grid spacing given in the input data set and the following locations of selected nodes, the grid may be reconstructed by the user.

Node	Decimal Degrees Latitude	Longitude
1,1	49.60	114.75
17,1	41.16	109.25
20,22	41.13	96.00
7,25	48.80	96.40

Leakage between the aquifers, flux into and out of the aquifers, and interaction with the overlying Lower Cretaceous units are also simulated. The model assumes constant water density conditions; therefore, water quality data sets are not given.

This preliminary data set is formatted for input to the three dimensional digital simulation model developed by P. C. Trescott and released as U.S. Geological Survey open-file report 75-438. As supplied, the data set provides the inital hydrological conditions as a starting point for computer predictions of the effect of stress upon the Ordovician Red River and Mississippian Madison aquifers within the 300,000 square mile modeled area.

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**FOR WKC IMPERMEABLE ** SALT BEDS ADDED***IK1=2IK2 ************FOR T1 AND T2 TH
    ANISOTROPY EXP. XFACTOR=.25X YFACTOR=4.    4/2/80
        21        26         3        95       319
          MASS                              ITKR
         1         1      .001         5
    168960    164960       2.0       0.1 12                                32 MILES
                                                                                 00
                                                                                 00
                                                                                 00
         1         1         1
       0.0       0.0       0.0       0.0       0.0       0.0       0.0        0.
       0.0       0.0       0.0       0.0       0.0       0.0       0.0        0.
       0.0       0.0       0.0       0.0       0.0       0.0       0.0        0.
       0.0       0.0
       0.0       0.0       0.0       0.0       0.0    3200.0    3200.     3200.
    3000.0    2800.0    2250.0    2530.0    2530.0    2350.0    2250.     1900.
    1700.0    1500.0    1250.0    1100.0    1000.0     950.0     900.      800.
     712.0       0.0
       0.0       0.0       0.0       0.0    3400.0    3400.0    3400.     3400.
    3300.0    3300.0    3000.0    3050.0    2800.0    2450.0    2350.     2300.
    2000.0    1800.0    1750.0    1650.0    1250.0    1000.0     900.      800.
     712.0       0.0
       0.0       0.0       0.0       0.0       0.0    3400.0    3400.     3620.
    3550.0    3520.0    3500.0    3300.0    3050.0    3100.0    2500.     2650.
    2300.0    2250.0    1900.0    1800.0    1650.0    1250.0    1000.     1000.
    1000.0       0.0
       0.0       0.0       0.0       0.0       0.0       0.0    3800.0    3650.
    3550.0    3520.0    3600.0    3450.0    3400.0    3350.0    3250.     2950.
    2600.0    2400.0    2250.0    1900.0    1800.0    1650.0    1500.     1250.
    1250.0       0.0
       0.0       0.0       0.0       0.0    3880.0    3850.0    3650.     3500.
    3550.0    3520.0    3600.0    3650.0    3600.0    3350.0    3300.     3250.
    2950.0    2400.0    2100.0    2000.0    1900.0    1800.0    1650.     1500.
       0.0       0.0
       0.0    3900.0    3880.0    3880.0    3800.0    3850.0    3550.     3500.
    3500.0    3450.0    3500.0    3700.0    3300.0    3650.0    3200.     3500.
    3000.0    2600.0    2400.0    1900.0    1900.0    1800.0    1600.        0.
       0.0       0.0
       0.0    3800.0    3800.0    3800.0    3800.0    3800.0    3550.     3500.
    3550.0    3550.0    3500.0    3400.0    3400.0    3400.0    3700.     3300.
    2850.0    2500.0    2300.0    2100.0    1900.0    1800.0    1700.        0.
       0.0       0.0
       0.0    3800.0    3800.0    3800.0    3800.0    3800.0    3700.     3650.
    3600.0    3550.0    3550.0    3450.0    3200.0    3250.0    3000.     2850.
    2600.0    2450.0    2160.0    2000.0    1900.0    1800.0    1700.        0.
       0.0       0.0
       0.0    3900.0    3900.0    4000.0    4100.0    3900.0    4100.     3750.
    3650.0    3600.0    3500.0    3500.0    3350.0    2850.0    2750.     2650.
    2350.0    2100.0    2000.0    2590.0    1900.0    1800.0    1700.        0.
       0.0       0.0
       0.0    3900.0    4000.0    4200.0    4300.0    4100.0    4100.     3750.
    3650.0    3600.0    3450.0    3350.0    3000.0    2650.0    2550.     2450.
    2100.0    2000.0    1560.0    1500.0    1500.0    1500.0       0.        0.
       0.0       0.0
       0.0    3900.0    4100.0    4400.0    4300.0    4200.0    4100.     3800.
    3700.0    3650.0    3600.0    3300.0    2850.0    2800.0    2600.     2450.
    2100.0    2000.0    2000.0    1740.0    1700.0       0.0       0.0        0.
       0.0       0.0
       0.0    3800.0       0.0       0.0    4100.0    4100.0       0.0        0.
       0.0    3750.0    5000.0    5000.0    2900.0    2650.0    2550.     2400.
    2100.0    2000.0    2000.0    2000.0    2000.0       0.0       0.0        0.
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   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0    3150.0    2900.0    2700.0    2500.
2250.0    2100.0    2000.0    2000.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0    3000.0    2700.0    2500.0       0.
2250.0    2100.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0    2750.0    2600.0    2400.0    2250.
   0.0    2100.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0    2650.0    2500.0    2300.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0    2500.
2400.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.
   0.0       0.0
    10         1         1
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
   0.0       0.0       0.0       0.0       0.0       0.0       0.0       0.0
   0.0       0.0
   0.0     310.0     310.0     320.0     320.0     320.0     330.0     340.0
 330.0     320.0     310.0     300.0     270.0     265.0     260.0     230.0
 200.0     190.0       0.0       0.0       0.0       0.0       0.0       0.0
   0.0       0.0
   0.0     340.0     340.0     335.0     350.0     360.0     360.0     350.
 335.0     335.0     340.0     300.0     270.0     265.0     260.0     230.
 200.0     190.0     175.0       0.0       0.0       0.0       0.0       0.0
   0.0       0.0
   0.0     340.0     360.0     370.0     380.0     390.0     380.0     365.0
 347.0     347.0     350.0     330.0     305.0     295.0     262.0     230.0
 200.0     190.0     175.0     165.0       0.0       0.0       0.0       0.0
   0.0       0.0
   0.0       0.0     360.0     370.0     380.0     400.0     375.0     365.0
 347.0     347.0     352.5     347.5     330.0     330.0     277.0     265.0
 210.0     190.0     175.0     165.0       0.0       0.0       0.0       0.0
   0.0       0.0
   0.0     360.0     360.0     370.0     390.0     410.0     380.0     360.0
 350.0     352.5     362.5     357.5     350.0     337.0     320.0     267.0
 250.0     200.0     200.0     175.0       0.0       0.0       0.0       0.0
   0.0       0.0
   0.0     360.0     360.0     400.0     446.0     340.0     362.0     337.0
 365.0     357.0     357.0     350.0     345.0     345.0     312.0     260.0
 235.0     210.0     190.0     160.0     140.0       0.0       0.0       0.0
```

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0.0	0.0						
0.0	0.0	0.0	360.0	446.0	416.0	360.0	345.0
370.0	365.0	362.5	352.5	345.0	317.0	295.0	267.0
245.0	210.0	190.0	160.0	140.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	400.0	400.0	400.0	387.0	380.0
367.5	365.5	357.5	352.5	345.5	305.0	267.5	247.5
225.0	200.0	185.0	160.0	135.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	430.0	378.0
372.5	365.0	357.5	352.5	340.0	300.0	275.0	252.5
225.0	200.0	175.0	160.0	145.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	410.0	370.0
365.0	360.0	370.0	340.0	315.0	275.0	265.0	265.0
233.0	205.0	185.0	175.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	600.0	370.0
355.0	365.0	365.0	350.0	310.0	275.0	255.0	245.0
230.0	225.0	205.0	190.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	450.0	370.0
390.0	385.0	465.0	365.0	305.0	285.0	255.0	265.0
240.0	230.0	220.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	550.0	370.0
375.0	395.0	550.0	370.0	335.0	305.0	280.0	265.0
260.0	245.0	230.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	570.0	370.0
375.0	375.0	395.0	360.0	325.0	310.0	280.0	265.0
225.0	220.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	560.0	450.0
395.0	360.0	355.0	330.0	325.0	300.0	265.0	245.0
0.0	200.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	0.0	450.0
390.0	360.0	350.0	0.0	0.0	280.0	255.0	225.0
215.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	0.0						
1	1	1					
3200.0	3100.0	3000.0	2500.0	2430.0	2370.0	2310.0	2250.
2100.0	2000.0	1875.0	1750.0	1625.0	1475.0	1250.0	1000.
900.0	800.0	780.0	770.0	760.0	750.0	730.0	720.

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710.0	710.0						
3300.0	3300.0	3300.0	3285.0	3400.0	3350.0	3250.0	2600.
2425.0	2250.0	2200.0	2150.0	2100.0	1900.0	1700.0	1525.
1250.0	1125.0	1000.0	800.0	780.0	770.0	760.0	720.
720.0	710.0						
3250.0	3250.0	3250.0	3400.0	3600.0	3500.0	2900.0	2600.
2400.0	2500.0	2500.0	2100.0	1700.0	1660.0	1760.0	1720.
1660.0	1525.0	1300.0	1000.0	800.0	780.0	760.0	740.
720.0	720.0						
4000.0	3800.0	3800.0	3800.0	3900.0	3800.0	3700.0	3450.
3300.0	3250.0	3200.0	3100.0	2900.0	2350.0	1875.0	1800.
1750.0	1575.0	1350.0	1500.0	1000.0	800.0	780.0	760.
740.0	720.0						
4075.0	3800.0	3800.0	3800.0	4200.0	4070.0	3200.0	3300.
3200.0	2900.0	2500.0	1925.0	2000.0	2000.0	1900.0	1850.
1800.0	1740.0	1525.0	1350.0	1200.0	1000.0	800.0	700.
600.0	500.0						
5000.0	4000.0	5100.0	5000.0	4950.0	4400.0	3200.0	2850.
2901.0	2463.0	2000.0	1885.0	1875.0	1800.0	1750.0	1750.
1800.0	1800.0	1740.0	1525.0	1400.0	1175.0	900.0	800.
700.0	600.0						
5500.0	5000.0	4450.0	4400.0	4450.0	3575.0	2898.0	2876.0
2891.0	2311.0	1834.0	1773.0	1712.0	1891.0	1650.0	1625.
1625.0	1750.0	1750.0	1625.0	1550.0	1000.0	900.0	800.
700.0	600.0						
6000.0	5500.0	5000.0	4400.0	4250.0	3425.0	1964.0	2409.0
2469.0	2057.0	2099.0	1937.0	1939.0	1941.0	1916.0	1892.0
1650.0	1600.0	1600.0	1600.0	1530.0	1490.0	1000.0	800.
700.0	600.0						
6100.0	6000.0	5000.0	4500.0	4400.0	4400.0	1955.0	2330.0
2084.0	2047.0	1901.0	2198.0	2070.0	2092.0	2000.0	1880.0
1780.0	1650.0	1675.0	1600.0	1530.0	1120.0	1010.0	800.
700.0	600.0						
6175.0	6100.0	5000.0	5000.0	4250.0	4500.0	6339.0	2312.0
1601.0	2332.0	1961.0	2475.0	2063.0	2070.0	2050.0	1990.0
1860.0	1800.0	1740.0	1650.0	1530.0	1300.0	990.0	800.
700.0	600.0						
6250.0	6175.0	6000.0	5000.0	4400.0	5000.0	4667.0	2446.0
2571.0	1790.0	2179.0	2076.0	2118.0	2167.0	2050.0	2100.
2000.0	1950.0	1850.0	1800.0	2000.0	1500.0	1000.0	800.
700.0	600.0						
6375.0	6250.0	6100.0	5700.0	4400.0	4490.0	5217.0	3382.0
2929.0	2748.0	3592.0	2099.0	2299.0	2100.0	2250.0	2200.
2150.0	2100.0	1900.0	1500.0	1500.0	1350.0	1050.0	800.
700.0	600.0						
6450.0	6375.0	6100.0	5700.0	5500.0	5500.0	4905.0	3000.0
3296.0	3378.0	4900.0	3222.0	2619.0	2300.0	2300.0	2175.
2075.0	2000.0	1600.0	1450.0	1330.0	1280.0	1150.0	800.
700.0	600.0						
6500.0	6400.0	6300.0	6200.0	6100.0	6000.0	4377.0	3000.0
2396.0	3696.0	3800.0	3800.0	2782.0	2130.0	2000.0	1840.0
1790.0	1745.0	1550.0	1340.0	1340.0	1260.0	1090.0	1000.
800.0	700.0						
6550.0	6500.0	6400.0	6300.0	6200.0	5800.0	4548.0	3191.0
3135.0	3509.0	3360.0	3312.0	2530.0	2120.0	2025.0	1790.0
1725.0	1720.0	1535.0	1335.0	1450.0	1820.0	1300.0	1300.0
1000.0	900.0						
6900.0	6800.0	6600.0	6500.0	6300.0	6050.0	5800.0	3714.0
5406.0	3383.0	2811.0	2476.0	2516.0	2145.0	2090.0	1980.0
1740.0	1605.0	1570.0	1330.0	1430.0	1605.0	1660.0	1300.
1250.0	1000.0						

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 7075.0    7050.0    7000.0    7000.0    6950.0    6975.0    7000.0    6000.
 5000.0    4500.0    4000.0    3133.0    2780.0    2140.0    2110.0    1970.0
 1820.0    1570.0    1570.0    1346.0    1440.0    1550.0    1500.0    1300.
 1250.0    1200.0
 7100.0    7075.0    7050.0    7050.0    7000.0    6000.0    5000.0    4500.
 4250.0    4000.0    3500.0    3000.0    2400.0    2200.0    2100.0    1900.
 1750.0    1600.0    1450.0    1400.0    1220.0    1160.0    1300.0    1250.
 1200.0    1200.0
 7125.0    7100.0    7075.0    7050.0    7000.0    6000.0    5000.0    4500.
 4250.0    4000.0    3500.0    3000.0    2400.0    2200.0    2100.0    1900.
 1750.0    1500.0    1400.0    1350.0    1300.0    1250.0    1200.0    1200.
 1200.0    1200.0
 7200.0    7175.0    7100.0    7090.0    7080.0    7050.0    7000.0    6000.
 5000.0    4500.0    4250.0    3500.0    3000.0    2400.0    2100.0    1900.
 1750.0    1500.0    1400.0    1260.0    1230.0    1200.0    1200.0    1200.
 1200.0    1200.0
 7200.0    7175.0    7150.0    7125.0    7100.0    7090.0    7050.0    7000.
 6000.0    5000.0    4500.0    4250.0    3500.0    3000.0    2100.0    1900.
 1750.0    1500.0    1400.0    1300.0    1200.0    1200.0    1200.0    1200.
 1200.0    1200.0
       1         1
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0  -1   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
-0   0   0   0  -1   0
 0   0   0   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0  -1   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0  -1  -1   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0  -1   0   0
 0  -1  -1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0  -1   0   0   0
 0   0  -1   0  -1  -1   0   0   0   0   0   0   0   0   0   0   0   0
 0  -1  -1   0   0   0
 0   0   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0   0
 0  -1  -1   0   0   0
 0   0   0   0   0  -1  -1   0   0   0   0   0   0   0   0   0   0   0
 0  -1   0   0   0   0
 0  -1  -1  -1   0  -1  -1   0   0   0   0   0   0   0   0   0   0   0
-1   0   0   0   0   0
 0   0   0   0   0  -1   0   0   0   0  -1  -1   0   0   0   0   0   0   0  -1
-1   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0  -1
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0  -1   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
```

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```
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
           1           1
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0  -1  -1   0   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0  -1  -1  -1   0   0  -1   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0  -1  -1  -1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0  -1  -1   0  -1   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0  -1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0  -1  -1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0  -1  -1  -1   0   0   0   0   0   0   0   0   0   0   0   0   0
  -1   0   0   0   0   0
   0   0   0   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0   0
  -1   0   0   0   0   0
   0   0   0   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0   0  -1
   0   0   0   0   0   0
   0   0   0   0   0   0  -1   0   0   0   0   0   0   0   0   0   0   0   0  -1
   0   0   0   0   0   0
   0   0   0   0   0   0  -1   0   0   0  -1  -1   0   0   0   0   0   0  -1
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0  -1   0   0   0   0   0   0  -1   0
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0  -1   0   0   0   0   0   0  -1   0
   0   0   0   0   0   0
   0   0   0   0   0   0  -1  -1   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0  -1   0   0   0   0   0  -1   0  -1   0   0
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
        -1           0
    1.E-4           1                   .25          4
   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
   0   0   0   0   0   0
   0   0   0   0   0 100 260 429 421 588 571 571 781 909109113541354152215631 21
1071 824 737 519 208   0
   0   0   0   0  25 104 526 526 471 571 571 806 8871111148116671957206519791 53
13571118 985 593 313   0
   0   0   0   0   0 104 316 210 352 571 6451111129616001875208321742083193517 1
171412941053 741 208   0
   0   0   0   0   0   0 235 592 658 786 9681304163021742386250025001935171417 1
14121211 815 417 104   0
   0   0   0   0 198 296 235 571 8211048112916301957250027382717208317141643129
1105 667 208  50   0   0
   0 100 136 261 326 395 395 645 8331083121918752083250027172407185716451250 95
 778 547 300   0   0   0
```

```
  0 156 261 424 435 471 588 789 929100012901500200030002717209718571471114 3 84
595 521 300   0   0   0
  0 444 652 896 737 522 706112910481210141715832189250020832090177614711043 92
741 417 100   0   0   0
  0 741117616131059 706100010001129129012861429194423962083165714711043 808 74
521 100  25   0   0   0
  0 417 696 824105911291296 966129010001059142916131693185514121263 889 815 74
208  25   0   0   0   0
  0 300 208 208 519 765 645 161 645 696 667 978149315671447119611 58 521 469 46
100   0   0   0   0   0
  0  25   0   0 185  69   0   0   0  50 104 444 941142911051105 741 417 300 30
 50   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0 222 696 469 417 313 300 100  5
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0  52 208 250   0  50  50   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0  25  75 100 100   0 100   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0  25  25  50   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0 100 100   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
    1.E-3         1                   .25         4
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  0  98  87  77  74  62  48  50  64  40  42  59 113 121  96 851  90  73   0
  0   0   0   0   0   0
  0 109  97  85  82  69  53  55  71  44  47  66 126 134 106  95 100  81  22
  0   0   0   0   0   0
  0 121 121 121 121 107  54  52  51  89  91 132 140 149 118 105 111  90  24  2
  0   0   0   0   0   0
  0   0 121 121 121 140  64  85  59  66  91 149 171 163 165 123 123 100  27  2
  0   0   0   0   0   0
  0 115 115 115  82  79  79 107 106 131 136 153 207 218 227 165 114  73  71  3
  0   0   0   0   0   0
  0  88  88  88  63  90 115 124 124 129 133 133 155 223 120 109  72  35  46  4
 46   0   0   0   0   0
  0   0   0  73  82  82  72  87  94  91 122 116 126 157 150 118 100  68  38  4
 40   0   0   0   0   0
  0   0   0  38  30  44  30  95  99  99 112 119 118 133 105 103  68  59  31  3
 11   0   0   0   0   0
  0   0   0   0   0   0  52  73  77  83  99 108 112 116  91  91  59  84  61  3
  4   0   0   0   0   0
  0   0   0   0   0   0  64  64  63  52  49  74  75 104  77  49  49  27  48  1
  0   0   0   0   0   0
  0   0   0   0   0   0  46  54  54  35  61  39  69  62  61  43  29  20  31  3
  0   0   0   0   0   0
  0   0   0   0   0   0  31  46  46  46  46  22  61  56  33  32  20  35   8
  0   0   0   0   0   0
  0   0   0   0   0   0  23  31  29  30  35   0  24  19  46  37  38  15   4
  0   0   0   0   0   0
  0   0   0   0   0   0  23  21  21  23  35  31  07  27  28  31  15  15   0
  0   0   0   0   0   0
  0   0   0   0   0   0  17  12  15  15  31   8   8  21  23  23   0   0   0
  0   0   0   0   0   0
```

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```
 0   0   0   0   0   0   0   1   1  15   2   0   0  12  15   2   2   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
   1.E-1           1                   1           1
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0  98  87  77  74  62  48  50  64  40  42  59 113 121  96 851  90  73   0
 0   0   0   0   0   0
 0 109  97  85  82  69  53  55  71  44  47  66 126 134 106  95 100  81  22
 0   0   0   0   0   0
 0 121 121 121 121 107  54  52  51  89  91 132 140 149 118 105 111  90  24   2
 0   0   0   0   0   0
 0   0 121 121 121 140  64  85  59  66  91 149 171 163 165 123 123 100  27   2
 0   0   0   0   0   0
 0 115 115 115  82  79  79 107 106 131 136 153 207 218 227 165 114  73  71   3
 0   0   0   0   0   0
 0  88  88  88  63  90 115 124 124 129 133 133 155 223 120 109  72  35  46   4
46   0   0   0   0   0
 0   0   0  73  82  82  72  87  94  91 122 116 126 157 150 118 100  68  38   4
40   0   0   0   0   0
 0   0   0  38  30  44  30  95  99  99 112 119 118 133 105 103  68  59  31   3
11   0   0   0   0   0
 0   0   0   0   0   0  52  73  77  83  99 108 112 116  91  91  59  84  61   3
 4   0   0   0   0   0
 0   0   0   0   0   0  64  64  63  52  49  74  75 104  77  49  49  27  48   1
 0   0   0   0   0   0
 0   0   0   0   0   0  46  54  54  35  61  39  69  62  61  43  29  20  31   3
 0   0   0   0   0   0
 0   0   0   0   0   0  31  46  46  46  46  22  61  56  33  32  20  35   8
 0   0   0   0   0   0
 0   0   0   0   0   0  23  31  29  30  35  00  24  19  46  37  38  15   4
 0   0   0   0   0   0
 0   0   0   0   0   0  23  21  21  23  35  31  07  27  28  31  15  15   0
 0   0   0   0   0   0
 0   0   0   0   0   0  17  12  15  15  31   8   8  21  23  23   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   1   1  15   2   0   0  12  15   2   2   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
  .6E-13           1
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
 0   0   0   0   0   0
 0   0   0   0   0   1   1   1   1   1   1   1   1   1   1   1   1   2   2
 2   2   2   4   8   0   0
 0   0   0   0   0   1   2   2   2   2   1   2   0   0   0   0   0   0   0   0
 2   1   3  26   0   0
 0   0   0   0   0   3   4   2   2   2   2   2   0   0   0   0   0   0   0   0
```

```
  2   4   6  24   0   0
  0   0   0   0   0   0  10   8   3   2   2   3   0   0   0   0   0   1   1   1
  1   1   8   0   0   0
  0   0   0   0   8   9   0  14   8   5   3   3   3   0   0   0   0   1   1
  2   1   7   0   0   0
  0   1   2   3   5   8  14  31  16   8   5   4   3   2   0   0   1   1   2   2
  2   2   7   0   0   0
  0   1   2   3   4   7  11  12  12  11   6   6   3   3   2   1   1   2   2   2
  3   5   0   0   0   0
  0   2   3   2   5   5  11  15  12  10   9   7   4   2   2   2   2   2   2   2
  5   0   0   0   0   0
  0   4   3  10  10   8   0  20  21  15   9   7   6   4   2   2   3   3   5   1
 21   0   0   0   0   0
  0   7  10  16  11  10   09999  63  47  43  11  16  12   4   3   4   4  12   2
 21   0   0   0   0   0
  0  10  10  72  12   0   0999999999999  24  21   9   6   5   5   6  10  21   2
  0   0   0   0   0   0
  0  21   0   0   0   0   0   0   09999   0   0  11   9   5  10   9  21  21
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0  30  15   7   5   7  21  21
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   09999  21  21   0  21  21   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0999999999999999   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0999999999999   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
   .3E-14         1
  0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
  0   0   0   0   0   0
  099999999 134  48  37 2419999  40  40  30  39  44  62  75  93 106 106   0
  0   0   0   0   0   0
  0999999999999 483  80  60  24  30  29  30  42   0   0   0  67  73  73 101
  0   0   0   0   0   0
  0   0   0   0  34  87  60  88  59  43  34   0   0   0   0   0   0  55  73   8
  0   0   0   0   0   0
  0   0   0   0   8  23  59 105  60  45  42   0   0   0   0   0  30  27  32   3
  0   0   0   0   0   0
  0  11  12  13  35  14  10  19  30  65   0   0   0   0   0   0   0  28  29   3
  0   0   0   0   0   0
  0  20  22  33  93  78  32  21  24  21  22   0   0   0   0   0   0  28  82   5
 29   0   0   0   0   0
  0   0   0  25  28  21  31  31  23  24  20   0   0   0   0   0  13  20  44   7
 81   0   0   0   0   0
  0   0   0  15  16  13  15  37  22  26  25   0   0   0   0  14  16  34  38  10
9999   0   0   0   0   0
  0   0   0   0   0   0   0  55  21  19  23   0   0   0  14  15  18  28  37  13
9999   0   0   0   0   0
  0   0   0   0   0   0   0  22  18  16  15   0   0  20  19  18  25  31  61999
  0   0   0   0   0   0
  0   0   0   0   0   0   0  21  17  14   9   0  20  21  22  23  27  42 242999
  0   0   0   0   0   0
  0   0   0   0   0   0   0  21  17  13   0   0  17  21  22  23  32 2019999
```

```
0    0    0    0    0    0
0    0    0    0    0    0   14   16   20   14    0    0   12   19   20   25   3799999999
0    0    0    0    0    0
0    0    0    0    0    0   26   21   15   17    0    0   14   16   18   20   469999    0
0    0    0    0    0    0
0    0    0    0    0    09999   18   15   10   10   14   16   77   22   42    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0    0   17   19   10   10    0    0   559999   289999    0    0
0    0    0    0    0    0
0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0    0
0    0    0    0    0    0
0    0    0    0    0    0
 168960
 16896.          1
     10         25         15         10         10         10         10         1
     10         10         10         10         10         10         10         1
     10         15         20         35         10
      1
      1          0          0          1          1          1         24
```