Connecting Networks

Computer networking requires that the computers in the network be linked. This problem considers a "linear" network in which the computers are chained together so that each is connected to exactly two others except for the two computers on the ends of the chain which are connected to only one other computer. For various reasons it is desirable to minimize the length of cable used. Your problem is to determine how the computers should be connected into such a chain to minimize the total amount of cable needed. In the installation being constructed, the cabling will run beneath the floor, so the amount of cable used to join 2 adjacent computers on the network will be equal to the distance between the computers plus 16 additional feet of cable to connect from the floor to the computers and provide some slack for ease of installation. Computer networking requires that the computers in the network be linked.

Input

The input file will consist of a series of data sets. Each data set will begin with a line consisting of a single number indicating the number of computers in a network. Each network has at least 2 and at most 8 computers. A value of 0 for the number of computers indicates the end of input. After the initial line in a data set specifying the number of computers in a network, each additional line in the data set will give the coordinates of a computer in the network. These coordinates will be integers in the range 0 to 150. No two computers are at identical locations and each computer will be listed once.

Output

The output for each network should include a line which tells the number of the network (as determined by its position in the input data), and one line for each length of cable to be cut to connect each adjacent pair of computers in the network. The nal line should be a sentence indicating the total amount of cable used. **In listing the lengths of cable to be cut, traverse the network from one end to the other.(Should start with the first point given in input, then begining with point connected to the one connected .... and so on).** Use a format similar to the one shown in the sample output, with a line of asterisks separating output for different networks and with distances in feet printed to **2 decimal places.**

Example

Input:

```
6
5 19
55 28
38 101
28 62
111 84
43 116
5
11 27
84 99
142 81
88 30
95 38
3
132 73
```

49 86
72 111
0

Output:

****
Network #1
Cable requirement to connect (5,19) to (55,28) is 66.80 feet.
Cable requirement to connect (55,28) to (28,62) is 59.42 feet.
Cable requirement to connect (28,62) to (38,101) is 56.26 feet.
Cable requirement to connect (38,101) to (43,116) is 31.81 feet.
Cable requirement to connect (43,116) to (111,84) is 91.15 feet.
Number of feet of cable required is 305.45.
****
Network #2
Cable requirement to connect (11,27) to (88,30) is 93.06 feet.
Cable requirement to connect (88,30) to (95,38) is 26.63 feet.
Cable requirement to connect (95,38) to (84,99) is 77.98 feet.
Cable requirement to connect (84,99) to (142,81) is 76.73 feet.
Number of feet of cable required is 274.40.
****
Network #3
Cable requirement to connect (132,73) to (72,111) is 87.02 feet.
Cable requirement to connect (72,111) to (49,86) is 49.97 feet.
Number of feet of cable required is 136.99.

NOTE: there is no extra line of asterisks at the end of output, take care of spaces within output lines and points at the end of lines

explanation

in case 3 begining with the first point in input connecting it to the most efficient point we need ,then in next line we first begin with the last point we write in the first line (72,111) and connecting it to it's efficient point, the same is for case one and two. by most efficient i mean (the point need to achieve the solution for the problem)