PROB 3. DIAL 911

You have been hired to develop a facilities management program for River City, Colorado. River City has just received a Federal grant to expand their fire protection by building new fire stations. Each of the city councilmen has been able to control the placement of the new fire station in their district, now it is up to you to determine the service area for each of the new fire stations.

You will be given a map, similar to the one below, showing the layout of the city and the placement of the stations. Your job is to mark each block on the map with the name of the fire station that can serve it with the shortest journey. Complicating your job is the fact that there are several obstructions to travel in the city. The river for which the city was named only has a few bridges across it, and there are some parks and cemeteries with no roads through them. On the map, a '.' marks a block with no obstruction, an '*' is an obstructed block, and a letter in the range 'A'..'J' marks the position of a fire station. The stations are named sequentially starting with 'A'. So if there were four stations they would be named 'A', 'B', 'C', and 'D'. The result of your efforts should be the same map with the dots replaced with the letter of the closest station. If two stations are equally close, the block should be served by the station with the lowest name. ('A' is lowest) Since the city is in flat country, all the streets run north-south and east-west, there are no diagonal streets, and all the blocks are square.

INPUT FILE:
The input will be a map consisting of a 20 by 20 grid of characters that contains at least two but no more than ten fire stations. The sample input file is available on your disk as PROB3.DAT.

Sample input:

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. . * . . . . . . . . . . . . . . . . .
. . . * . . . . . . . . . . . . . . . .
. . . * . A . . . . . . . . * * * . . .
. . . . * . . . . . . . . . * B . . . .
. . . . . . * . . . . . . . * * * . . .
. . . . . . . . . . . . . . . . . . . .
. . . . . . * * . . . . . . . . . . . *
. . . . . . . * * . . . . . . . . * . .
. . . C . . . . . * . . . . . . . * . .
. . . . . . . . . . * . . . . . . . * .
. . . . * * * * . . . . . . . . . . * .
. . . . * * * * . . . * . . . . . . . .
. . . * . . . . . . . . * * . . * . . .
. . . * . . . . . . . . . * * . . . . .
. . . * . . . . D . . . . . . . . . . .
. . . * . . . . . . . . . . . . . . . .
. . . * . . . . . . . . . . . . . . . .
. . . * . . . . . . . . . . . . . . . .
. . . * . . . . . . . . . . . E . . .
. . . . . . . . . . . . . . . . . . . .
```

OUTPUT FILE:
The ouput should consist of a 20 by 20 grid of characters like the input except with the dots replaced by the name of the closest station. If two stations are equally close, use the station with the lower name of the two.

Sample output:

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**********************
* Team ##, Problem 3 *
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CC*AAAAAAAAABBBBBBB
CCC*AAAAAAAAABBBBBBB
CCC*AAAAAAAAAA***BBB
CCCC*AAAAAAAAA*BBBBB
CCCCC*AAAAAAAB***BBB
CCCCCAAAAAAABBBBBBBB
CCCCC**AAAAABBBBBBB*
CCCCCCC**AADBBBBBBB*E
CCCCCCCCC*DDDBBBB*EE
CCCCCCCCDD*DDDBBBB*E
CCCC****DDDDDDDBBE*E
CCCC****DDD*DDDEEEEE
CCC*DDDDDDDD**DE*EEE
CCC*DDDDDDDDD**EEEE
CCC*DDDDDDDDDDDEEEEE
CCC*DDDDDDDDDDEEEEEE
CCC*DDDDDDDDDEEEEEEE
CCC*DDDDDDDDEEEEEEEE
CCC*DDDDDDDEEEEEEEEE
DDDDDDDDDDDDEEEEEEEE
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***** End of Output *****
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