Problem 3: Hexudoku

Hexudoku is a game of logic in which the goal is to fill in a grid with hexadecimal digits from 0 to F. The grid has 16 rows, 16 columns, and 16 4x4 quadrants. The game starts with a partially filled in board, like the one shown below. The goal is to fill up the rest of the board with hexadecimal digits from 0 to F so that no row, column, or quadrant contains a repeated digit.

D15-	--0-	-8--	---3
----	7-C-	-4EB	----
6--B	-E-2	--9-	----
--C-	--48	7--0	----
A--8	5--6	4---	B--0
-3D-	---E	----	-7--
----	----	---4	1---
-7--	--D-	----	----
C---	----	B---	----
---E	3---	----	-4--
---9	----	--A-	--0-
-5--	---1	----	----
----	---C	----	9---
B---	----	0--A	3---
----	4---	----	----
-D--	8---	-C--	5---

For reference, the hexadecimal digits (in order from least to greatest) are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F.

Lazy Larry almost never completes a Hexudoku game, but his simple strategy does make quite a bit of progress. He starts in the top left corner and scans to the right until he finds a blank cell. Then he looks for the smallest hexadecimal digit that can go there without creating a conflict in its row, column, or quadrant. If he finds one, he fills it in. Then he moves to the right until he finds another blank cell and fills it in the same way. He continues until the first row is finished, then moves to the first cell in the next row down and continues until he reaches the bottom right corner. Then he gives up.

Applying this strategy to the board above, the first cell Larry can fill in is the 4th from the left in the top row. Digits 0 and 1 both create conflicts but 2 is safe. In the next cell over 0 through 5 are no good, but 6 works. Eventually, he ends up with the board on the right.

D152	690A	C8F-	4B73
083A	71C5	24EB	69DF
647B	DE32	159-	08AC
9ECF	B-48	7360	215-
A218	5376	49CD	BEF0
43D0	128E	56BF	A79-
569C	0ABF	3274	1D8-
E7B-	94D-	801-	C235
C021	A564	B738	DFE9
7A6E	3029	D15C	84B-
3B49	C7ED	6FA2	-501
85FD	-B-1	9E0-	7326
1F03	265C	EB47	9A-8
B984	ED17	0-2A	36C-
2CA5	4F90	-D81	E--7
-DE6	8-A3	FC-9	5012

DATA21.txt (DATA22.txt for the second try) contains 10 Hexudoku boards. Each board consists of 16 lines of 16 characters each. A blank cell is represented with a '-' character (ASCII code 45). Your job is to report the progress Lazy Larry will make by following the simple strategy described above. The output should be one line for each test case reporting the number of blanks Larry manages to fill in.

The sample input on the next page contains only 3 test cases, and is laid out in 3 columns for easier reading.

Sample Input

```
--A---------5---
-CF--B-9--------
----------5----0
--------------9-
---7---3-----BF-
-B------0-7-----
-F-----C-----D--
---------4-D----
-----------4----
--7-------------
---E---------5--
----D-2-8---A---
-------------F--
---------A-9----
------------6---
------70--8-----
```

```
D15---0--8-----3
----7-C--4EB----
6--B-E-2--9-----
--C---487--0----
A--85--64---B--0
-3D----E-----7--
-----------41---
-7----D---------
C-------B-------
---E3--------4--
---9------A---0-
-5-----1--------
-------C----9---
B-------0--A3---
----4-----------
-D--8----C--5---
```

```
----B-----C1F--8
---C--4-F-5-D---
--E----1----4--9
-0--172--D------
----4---3----A--
--7----------8--
-------C53------
-D--0-----------
---A62---4---3--
--0F-9-----B---D
----7--8A--6----
E----8------3-9-
4------EB-F-----
7-2-81------A---
--9---8--13-E---
--------1---C---
```

Sample Output

```
189
176
164
```