

Program Name: kritters.cpp

Input File: kritters.dat

Grok caveman. Grok have kennel. Grok have kritters. Grok notice some kritters eat other kritters. Grok notice some kritters fight other kritters. Kritters eat other kritters, kritters fight other kritters, bad for business. Help Grok put kritters in cages, so no kriter eat other kriter, no kriter fight other kriter. Grok draw picture of kennel:

```

| 1 | 2 | 3 |
| 4 | 5 | 6 |
| 7 | 8 | 9 |

```

Each square cage. Nine squares, nine cages. Grok good artist, no?

Grok smart. Grok learn:

1. Cage either have no kriter or one kriter. Grok want kritters uncrowded, happy.
2. Dog in cage next to 2 or more dogs in cages, dogs fight. Fish in cage next to 3 or more fish in cages, fish fight.
3. Dog in cage next to cat in cage, dog eat cat. Cat in cage next to mouse in cage, cat eat mouse. Cat in cage next to bird in cage, cat eat bird. Cat in cage next to fish in cage, cat eat fish. Bird in cage next to fish in cage, bird eat fish.
4. Cage "next to" cage if it shares side with cage (cage 1 next to cages 2 and 4, cage 2 next to cages 1, 3, and 5, ...cage 5 next to cages 2, 4, 6, and 8, etc.).

### Input Description

Input to this problem will consist of a (non-empty) series of up to 100 data sets. Each data set will be formatted according to the following description, and there will be **no blank lines** separating data sets.

A single data set has 1 component:

*Cage Configuration* - Three lines representing a configuration of animals placed in cages. The arrangement of the cages will be as indicated in Grok's drawing above. Each cage will be represented by a single letter, where:

- "B" indicates a bird is in this cage,
- "C" indicates a cat is in this cage,
- "D" indicates a dog is in this cage,
- "F" indicates a fish is in this cage,
- "M" indicates a mouse is in this cage,
- "N" indicates there is no animal in this cage

Note that there will be no spaces separating the letters in the input data sets.

### Output Description

For each data set, there will be exactly one line of output. If the input configuration is one in which no kriter will eat another kriter and no kriter will fight with another kriter, the output will be a single line with the statement "GROK HAPPY". Otherwise, the output will be a single line with the statement "GROK SAD".

### Sample Input

```

BDD
BMF
DFF
CMM
NMM
MMM

```

### Sample Output

```

GROK HAPPY
GROK SAD

```