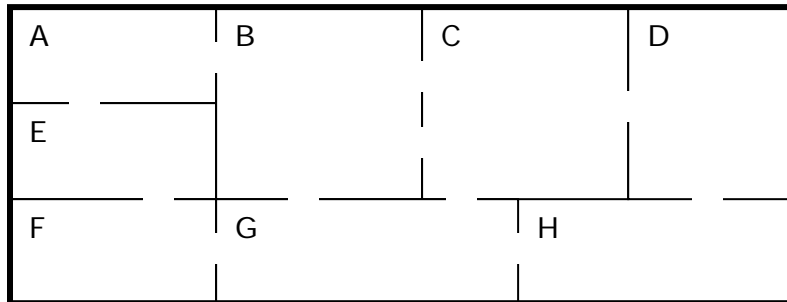


Networks: #2 Rat Maze

Peter is experimenting with rat psychology. He builds a maze for his rats to move through. He rewards them if they manage to go through each gap once and only once.

His newest maze is below:



- (a) Can a rat make it through the maze going through each gap once and only one? Explain your answer in detail.

Below is a table for another similar maze, with the times in seconds to go from area to area:

| | | | | | | | | |
|---|----|----|----|----|---|---|----|----|
| | A | | | | | | | |
| B | 12 | B | | | | | | |
| C | - | - | C | | | | | |
| D | - | - | 10 | D | | | | |
| E | - | - | - | 8 | E | | | |
| F | 9 | 8 | - | - | - | F | | |
| G | - | - | - | - | - | 7 | G | |
| H | - | 15 | 8 | - | - | - | 10 | H |
| I | - | - | | 16 | 7 | | | 18 |



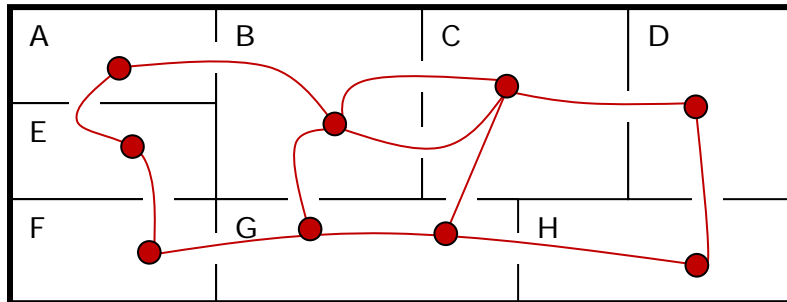
- (b) Draw the maze, and use that to find the quickest path between A and E.

- (c) Can a rat make it through this maze going through each gap once and only one?

Answers Networks #2 Rat Maze

Peter is experimenting with rat psychology. He builds a maze for his rats to move through. He rewards them if they manage to go through each gap once and only once.

His newest maze is below:

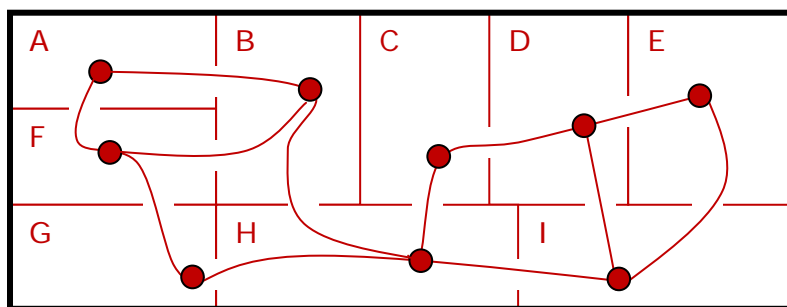


- (a) Can a rat make it through the maze going through each gap once and only one? Explain your answer in detail.

Every vertex is even in the network. So a rat can make a lap back to where it started from any starting position going through each door without.

Below is a table for another similar maze, with the times in seconds to go from area to area:

| | | | | | | | | |
|---|----|----|----|---|----|---|----|----|
| | A | | | | | | | |
| B | 12 | B | | | | | | |
| C | - | - | C | | | | | |
| D | - | - | 10 | D | | | | |
| E | - | - | - | 8 | E | | | |
| F | 9 | 8 | - | - | - | F | | |
| G | - | - | - | - | - | 7 | G | |
| H | - | 15 | 8 | - | - | - | 10 | H |
| I | - | - | | 6 | 18 | | | 12 |



- (b) Draw the maze, and use that to find the quickest path between A and E.

The quickest path is A – F – G – H – C – D – E

- (c) Can a rat make it through this maze going through each gap once and only one?

There are four odd vertices in the network (B, D, F and I) so a rat cannot make a full lap without repeating or door, no matter where it starts.