Category: Very Hard

Competition: CSI KJSCE Code Wars 2017-18. Try it in a contest environment:

<https://www.hackerrank.com/contests/codewars2-round2/challenges/mumbai-floods>

The question was not solved completely by any of the participants during the contest. It is way more difficult than most of the previous questions in this collection. The algorithm for solving needs knowledge of some more complicated data structures like Priority Queue and needs a very good grasp on recursion or disjoint sets depending on the approach being used to solve the problem. Understanding the statement is not that easy either as it represents conditions or flood water flow pertaining to a real life scenario. This requires a 3D visualisation of the challenge before even the coding starts.

Concepts Tested:

1. The problem basically needs:
   1. Very good visualisation for understanding the situation
   2. Then flow of water needs to be simulated to mark the drains
   3. Then rising water level needs to be simulated to find flooded regions which is a very complicated task in itself because flooded regions may reach drains or merge with other flooded regions which are already being drained
   4. The last step is to identify the regions not flooded and even connected to the shore and the regions not flooded and disconnected from the shore.
2. Use of classes and objects may become necessary as the number of variables associated with every element of the problem is pretty high.
3. Priority Queue is needed
4. Stack or disjoint sets will be needed based on the approach one wishes to use
5. Very good knowledge of recursion
6. Very large number of situations is provided in test cases which filter only the correct algorithms. Hence a heuristic based approach will not get all cases right.