

## 1 ADT Basics

Consider the following scenarios and choose the appropriate ADT to tackle the problem.

At her internship, Jessica is responsible in building logging functionality for the company's latest puzzle game. In the game, characters can move up, down, left, or right at any given timestep and can die at any time.

- a. Suppose Jessica wants to be able to keep track of all the character movements starting at time step 0. What ADT can she use to accomplish this?
- b. Tess, Jessica's coworker, would like the game log to also keep track of whether or not a given character has made all possible movements (up, down, left, right). What ADT can be used to implement this?
- c. Jessica would also like to keep track of what movements lead to the characters death and record the timestamp of these movements. Assume that there is atleast one movement that never leads to the character's death. What ADT can be used to accomplish this?

## 2 This Question is Also About ADTS

Suppose we wanted to adjust the Stack class to also be able to support a min function which finds the minimum value in the stack. Briefly describe how we can implement this operation to take  $O(1)$  time.