Lecture 3

Linked Lists 1 (Application)

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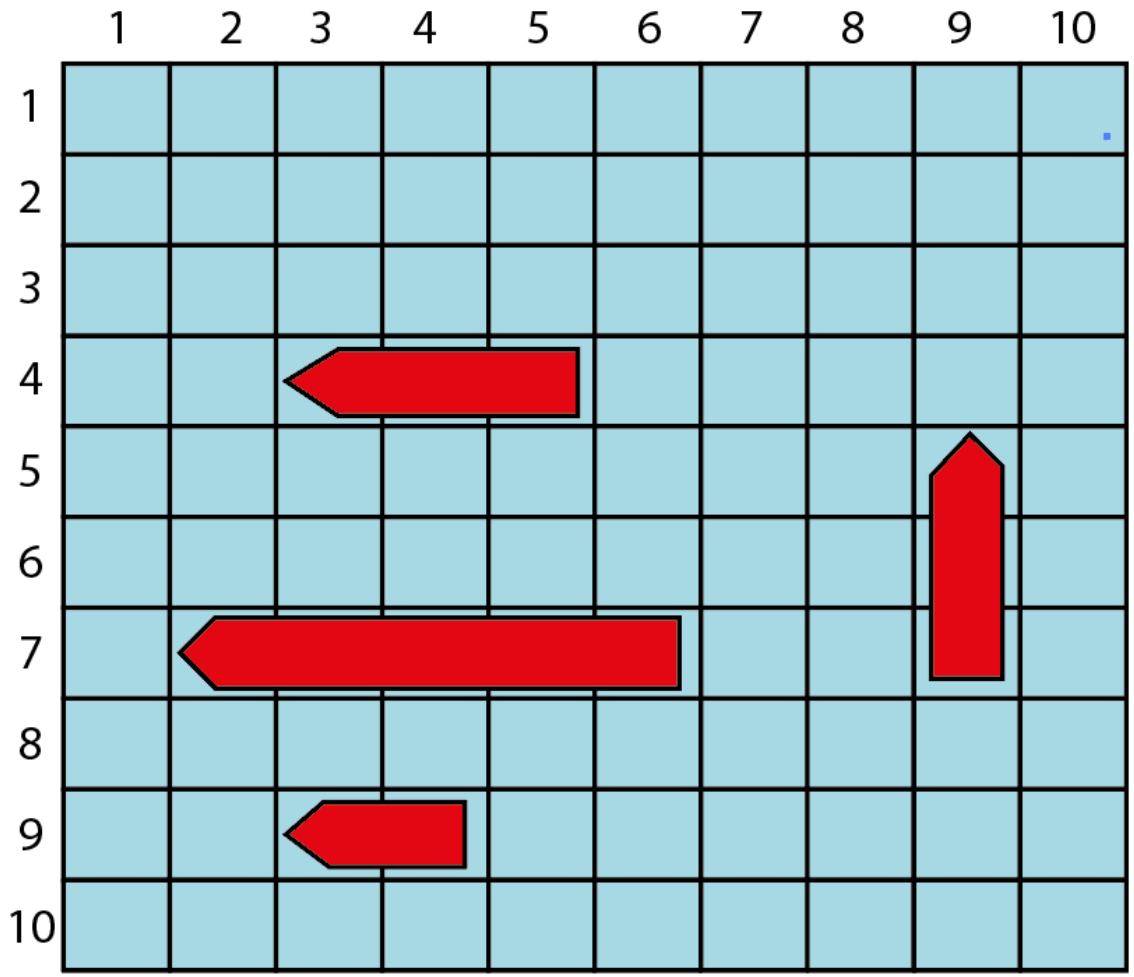
Battleship Game

- In the single-player mode of the battleship game, you play as a general with a cannon and limited ammunition, tasked with attacking enemy ships positioned on tiles of a 2D map.
- If you hit a battleship, it sinks. If all the ships are sunk on the map, the player wins the game.

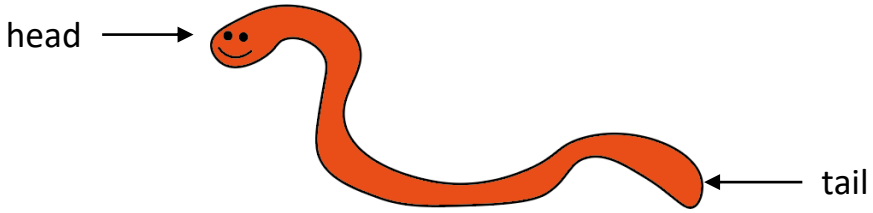
For the given map:

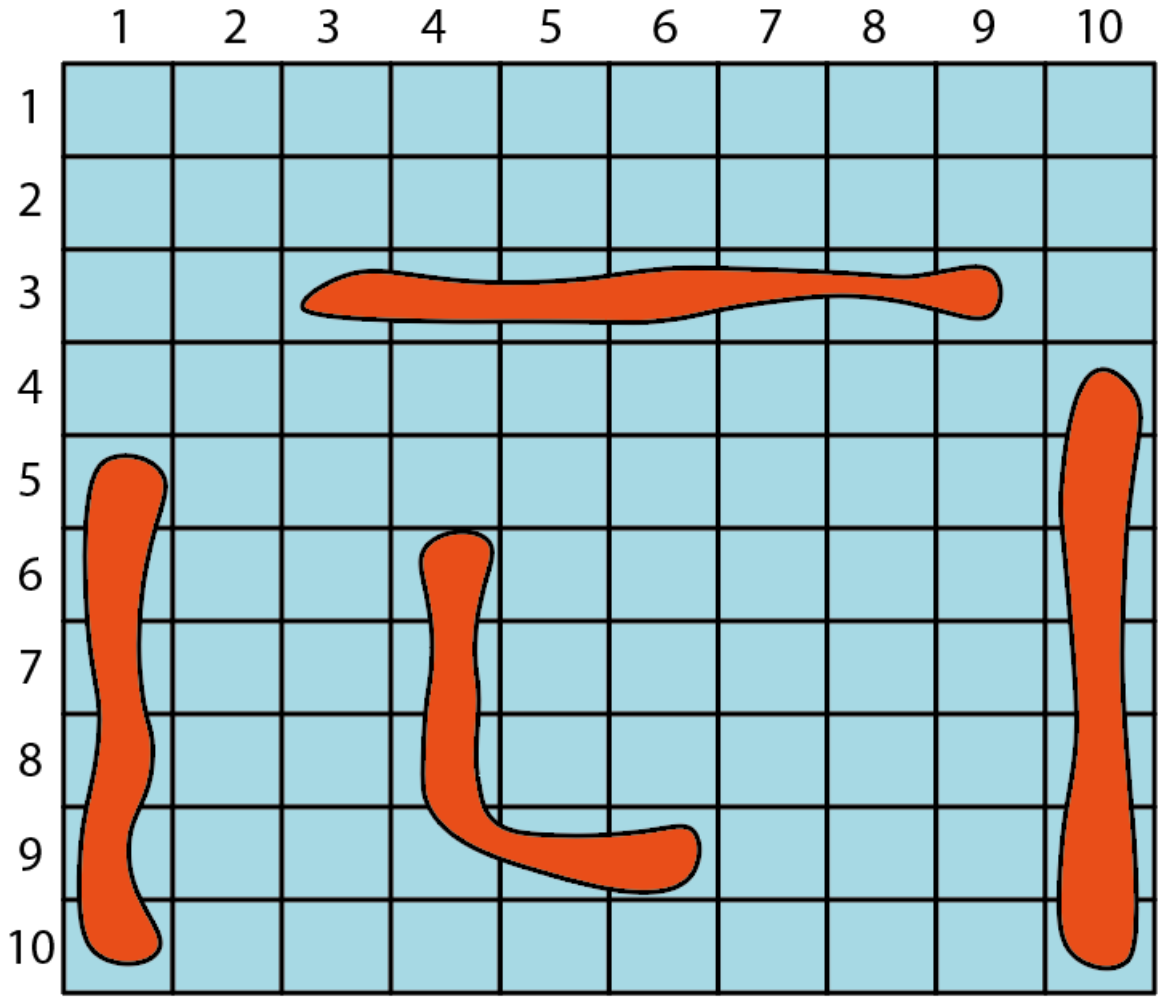
>(4,2)
Miss. Remaining ships: 4.
>(4,3)
Hit! Remaining ships: 3.
…



Battleworm Game!

- We may change the game and the rules.
- In the BattleWorm™ game, you play as a farmer attacking the worms in the garden.





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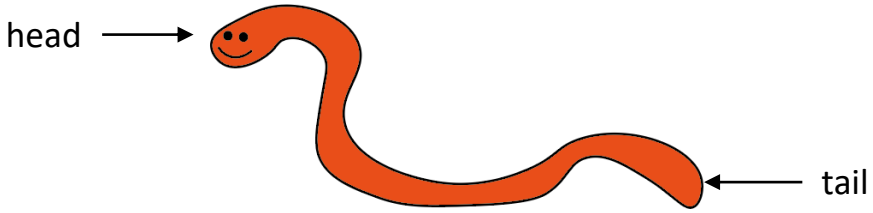
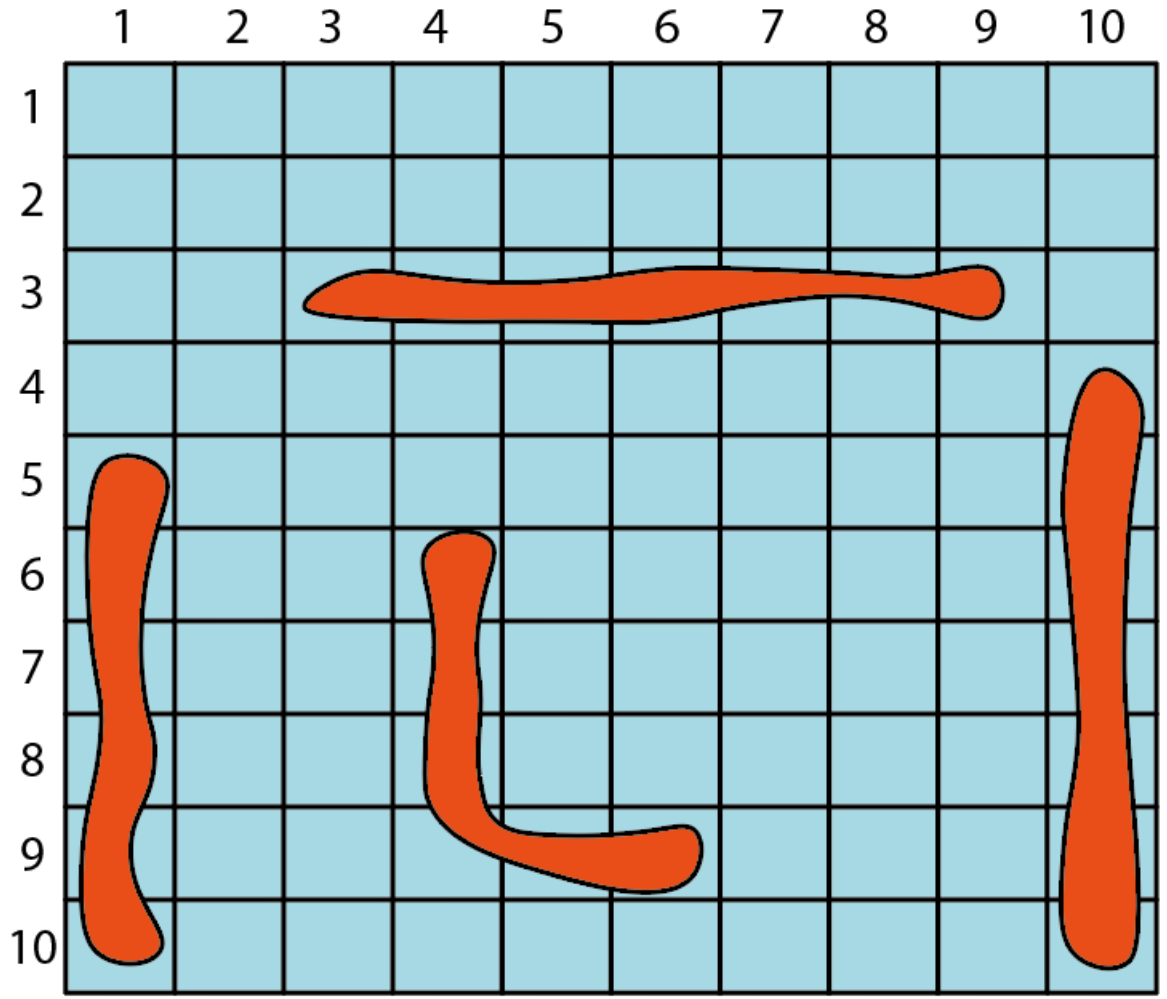
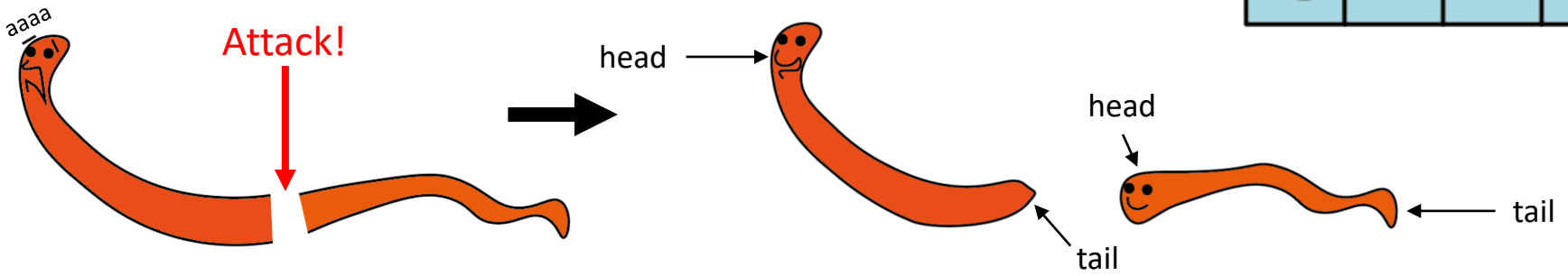


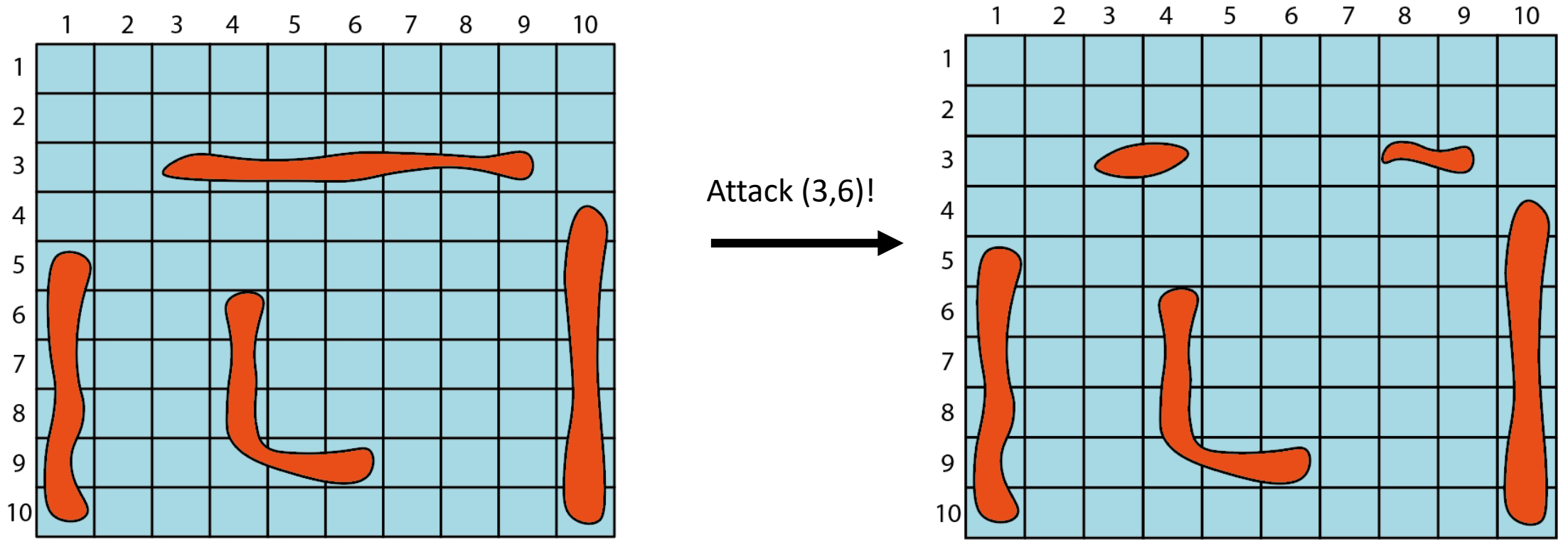


Attack on a worm may create two new worms!



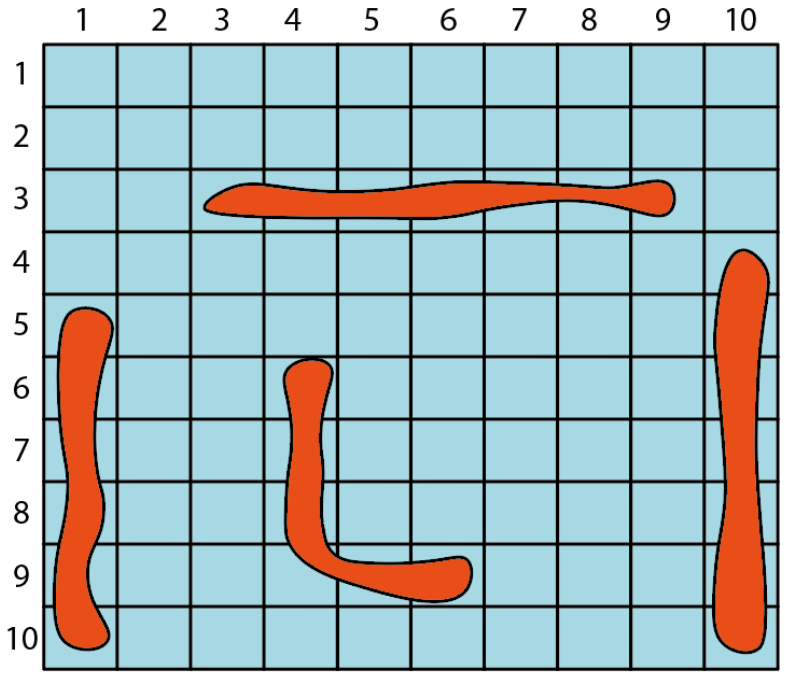
Battleworm Game!

- Attacking a tile of a worm will destroy its parts from previous and next tiles.



Battleworm Game!

- With the skeleton code, text files for worm coordinates are also given.



worm1.txt

linked_list > worn

```
1   5 1
2   6 1
3   7 1
4   8 1
5   9 1
6   10 1
7
```

- A tile of a worm could be stored in a WormPart data structure.

```
struct WormPart{
    int x,y;
};
```

- A worm is a list of WormParts.

```
DoublyList<WormPart*>* worm = new DoublyList<WormPart*>;
```

- Instead of using a matrix structure, we can store a list of worms to represent the field.

```
DoublyList<DoublyList<WormPart*>*> wormfield;
```