The Common Constraints Handout

Strings, Arrays and Numbers

- How many elements can be in the array?
- How large can each element be? If it's a string, how long? If it's a number, what is the minimum and maximum value?
- What is in each element? If it's a number, is it an integer or a floating point? If it's a string, is it single-byte or multibyte (unicode)?
- If the problem involves finding a subsequence, does "subsequence" mean that the elements must be adjacent, or is there no such requirement?
- Does the array contain unique numbers or can they be repeated (this is sometimes relevant)?

Grids/Mazes

- For problems where some actor (e.g. a robot) is moving in a grid or maze, what moves are allowed? Can the robot move diagonally (hence 8 valid moves), or only horizontally / vertically (hence only 4 valid moves)?
- Are all cells in the grid allowed, or can there be obstacles?
- If the actor is trying to get from cell A to cell B, are cells A and B guaranteed to be different from each other?
- If the actor is trying to get from cell A to cell B, is it guaranteed that there's a path between the two cells?

Graphs

- How many nodes can the graph have?
- How many edges can the graph have?
- If the edges have weights, what is the range for the weights?
- Can there be loops in the graph? Can there be negative-sum loops in the graph?
- Is the graph directed or undirected?
- Does the graph have multiple edges and / or self-loops?

Return Values

- What should my method return? For example, if I'm trying to find the longest subsequence of increasing numbers in an array, should I return the length, the start index, or both?
- If there are multiple solutions to the problem, which one should be returned?
- If it should return multiple values, do you have any preference on what to return? E.g. should it return an object, a tuple, an array, or pass the output parameters as input references? (This may not be applicable in languages allowing you to return multiple values, e.g. Python)
- What should I do / return if the input is invalid / does not match the constraints? Options may be to do nothing (always assume the input is correct), raise an exception, or return some specific value.
- In problems where you're supposed to find something (e.g. a number in an array), what should be returned if the element is not present?