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## FOR:

- 1. **Conciseness:** Functional programming (FP) languages including Haskell are known for higher conciseness, descriptiveness and readability in comparison to imperative programming languages. When having the task of finding the largest connected component, FP techniques (i.e. list comprehensions, higher-order functions, recursion) can be really useful in terms of efficient processing and transforming lists of data and reducing the amount of code.
- 2. **Immutability:** Functional programming languages are known for immutable data and pure functions, which makes the code more predictable and easier to reason about. Avoiding side effects and mutable states and eliminating the possibility of unexpected changes to data helps to prevent bugs and makes the code more testable and reusable. This is particularly useful when dealing with complex algorithms and problems, such as finding the largest connected component, which may require a lot of data manipulation and processing.

## AGAINST:

- 1. **Memory usage:** Since functional programming typically avoids mutable states, it often requires more memory to keep track of intermediate results, which can lead to memory problems. The use of recursion and lazy evaluation in FP can also be the cause of extra memory allocation. This can be an issue when dealing with big data sets, such as searching for the largest connected component in complex graphs.
- 2. **Efficiency:** While functional programming is more concise and easier to reason about for many types of algorithms, it may not be the most efficient choice for all the problems. For example, finding the largest connected component in a graph can require traversing the graph multiple times and updating mutable data structures. While this is certainly possible to do in an FP language, it may be less efficient than using a mutable data structure and imperative programming techniques.

## CONCLUSION

Based on the arguments discussed previously, using functional programming is a **suitable** method for finding the largest connected component in a 2D grid. While concerns regarding performance and efficiency do exist, functional programming languages offer several advantages in terms of reusability and maintainability.

By enabling the definition of pure functions that operate on immutable data structures, functional programming ensures code correctness (as the grid in the given task is immutable, it can be safely passed around without the risk of being changed by other parts of the program). Furthermore, the use of list comprehensions and higher-order functions like foldr enables the expression of complex operations in a more concise and descriptive manner, thereby reducing the need for excessive boilerplate code.

While other paradigms, such as object-oriented or procedural programming, could also be used to solve this task, they would likely require a larger amount of code and be more error-prone than a functional approach. For example, in object-oriented programming, classes would need to be defined to represent the grid and the connected components, resulting in more boilerplate code. Similarly, in a procedural approach, mutable states would need to be managed manually, leading to bugs and making the code harder to reason about. Nonetheless, if performance is a crucial thing, procedural programming that prioritizes memory usage optimization and minimizes function calls may be a more suitable option. Therefore, the choice of paradigm relies on the specific needs of the problem and the language's strengths.

In conclusion, although trade-offs must be considered, using functional programming is well-suited for solving the given problem and provides significant benefits compared to other paradigms.