Read Dicheva & Hodge (2018). Think about an online system which you use on a daily basis. Consider how it might operate at the back-end using data structures. This will inform our discussion during next week's seminar.

Social media platforms such as Instagram use data structures and algorithms throughout their entire code base. For example, Instagram stores a users' credentials in map for authentication. Additionally, Instagram have their own algorithm that leverages AI to recommend posts based on a range of factors such as your likes, search history, posts and comments.

With large amounts of data being processed every second, time and space complexity is a key factor as if it took a significant amount of time for a user to perform an action, they would stop using the platform which would have a significant impact on the business as they wouldn't be able to charge as much for ads as there aren't as many active users. The space and time complexity can be greatly reduced by using the appropriate data structures and sorting algorithms.

In conclusion a range of data structures and algorithms are used throughout Instagram's code base as the appropriate data structure to use will depend on your use case, for example the time complexity for retrieving a value from a HashMap is O(1) whereas the time complexity for a retrieving a value from a list is O(n) making it not suitable for storing large amounts of data.

References

Okeke, C. (2023) Mastering Big O Notation: Understanding Time and Space Complexity in Algorithms. Available from: https://medium.com/@DevChy/introduction-to-big-o-notation-time-and-space-complexity-f747ea5bca58 [Accessed 26th August 2024].