**Data structures, structuring our world.**

**Q:** How can data structures be used to solve real-world problems in fields such as biology, medicine, or finance? Provide examples of research or applications that have leveraged data structures to address complex problems in these fields.

**A:** Data structures are necessary for storing, orgnanising and manipulating data in a computer system, they are a good friend to any Software Engineer when it comes to solving problems or completing tasks in front of the computer screen, but not only.

Data structures are used and to solve real-world problems in numerous fields, making our lives much easier, even when we’re not aware of it.

* In Biology data structures are used in DNA sequencing, the human genome consists of 3 billion base pairs, organizing or searching through all this data would be a difficult task for anyone if it wasn’t for the Burrows-Wheeler transform, which is based on the concept of suffix arrays and indexing the genomic data. Genome assembly which is the process of piecing millions of short DNA “snapshots” to reconstruct the complete genome sequence.
* Data structures in Medicine are used to store and analyze the patient data, with the usage of decision trees a model can be built to predict clinical trial outcomes based on their medical history and other factors. Data structures are also used to analyze Eletronic Health Data which contain detailed patient information, including their medical history, lab results, medication, and allergies. Data structures like trees, hash tables, and linked lists are used to organize and search EHRs efficiently, allowing healthcare providers to access and analyze patient data in real-time.
* In finance data structures find a wide use when it comes to storing and analyzing time-series data, such as stock prices, market indices and trading volumes, giving us real-time information for any of the categories mentioned above. Other data structures like linked lists and arrays are used to efficiently store and retrieve time-series data in real-time trading systems, or queues which are specifically used to store price data when it comes to stock prices

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