Data Structure and Algorithm

Data Structure

Data structure is a kind of data type that announce the type of the variable such as integer, float, array and so on. Data structure can store the data. For example you can add data with an array. You can add data whatever you want. But how will you select those data. You can select the data. But the data will be like a trash and for a normal user can be confuse. Data must be need clear for the end user. For example, there are many search engines. Among them, Google search engine is most useful. So why Google engine is most useful? Because of the algorithm, it's more powerful. Algorithm is to learn about the program to make more performance as a backend coding.

Algorithm

Algorithm is a detailed step by step method for solving a problems. It is well developed and good approach to solving complex problems. For example, make sorting the data. Without algorithm you can also sort data. But it's difference. It might be take more time to sort. So algorithm is to make a good performance program. As an example with Google Search engine. Why it is used by all people? Because of the search algorithm, it can make more performance of the search result. So Algorithm is to find the best way solution of the program performance. In easy way, every program has their own original design, color and structure. Like fast sorting, fast searching, fast saving and so on. So algorithm is one of the design, color structure of the program.

So for example with the video call application like Viber, Discord, Messenger and so on. Before inventing those application, we connect with the satellite connection to connect each other. In satellite, we have to wait a minute to hear the voice. When hearing voice, we can't hear clearly the voice. It has some barriers noises. Because it through the satellite and at that time developer don't know the better algorithm. So after that, developer think about the algorithm to clear the barriers noises. Viber, Discord, Messenger and such like application has different algorithm to prevent from the external voice barriers. So Algorithm is to make the application better with the better performance. That is why we learn about the algorithm.

Sorting Algorithm

There are many type of algorithm such as sound clear algorithm, searching algorithm and so on. Among them I want to explain about the sorting algorithm. Sorting Algorithm is a kind of algorithm that find to make sort fast. You can make sort without algorithm. But sorting can make you to make better performance in sorting. There are many type of sorting algorithm and I want to explain their benefits and limitation.

Selecting Sort

Selecting sort is to select a small number and put at the beginning. Selecting sort is easy for a junior programmer and easy to understand. For example there has an array room and all the room are unsorted. With selecting sort, it will select smallest number that has in that array and put it at the first index of the array and the first array will reach to the smallest number room. After that, the first index of the array will lock and it will start from the next room of the lock array index.

As a real world example, it will use in student grade result in each classes. In classes, it will only have 60 or 70 students in a class. So selecting sort can make faster.

Benefits of Selecting Algorithm	Limitation of Selecting Algorithm
• **The Sorting is very fast**	• it will doesn't effect in so many data
• **It use less memory**	• If the data is too much it can take much time
• **It doesn't need temporary storage to store an index**	• It doesn't match with a huge business

Selecting sort is good for only if the data is less than 60 or 70. It can't handle 100 of data. Because it can take much time to finish it in a short time. And it doesn't support in a large business. In my example, it is suitable for a classroom grade of student. Because, it only have 60 or 70 students. In short, selecting sort is good for less data, if not it will take long time to make sort.

Inserting Sort

Inserting Sort is a kind of algorithm that select an array index number and check with the right array indexes. And it will catch as an temporary memory after check with right index. If the right index is correct it will stop mark temporary and put a real number. If not it continue store temporary and check with the right index rooms.

With a real world example, a card games, poker as an Microsoft games. It will give you un sorted number and you need to make with minimum number to maximum number. It use Inserting sort to make an order. Inserting sort is also simple and it can easy to understand.

Benefits of Inserting Sort	Limitation of Inserting Sort
• **It is simple to understand and easy to use**	• It doesn't perform as well as other sorting. Because it repeated again even the condition is true
• **It comfortable with small business**	• Doesn't support for large business
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Inserting sort is also good for the small business and it is only good what to do exactly. For example, sorting poker (Cards) program game. So we know how many poker does it have and the selecting poker will little to play. So we can know the counter exactly. At that time, we can use inserting sort to sort the poker program. And it doesn't support large amount of data and doesn't know the total counter.

Quick Sort

Quick sort is a divide and Conquer algorithm. It pick one of the number that has in the array index as pivot. After getting pivot it make partition into left and right. There may be different for quick sort for getting pivot. The pivot can get by the following statement.