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Abstract: This article provides information about the importance of mathematics in computer science.

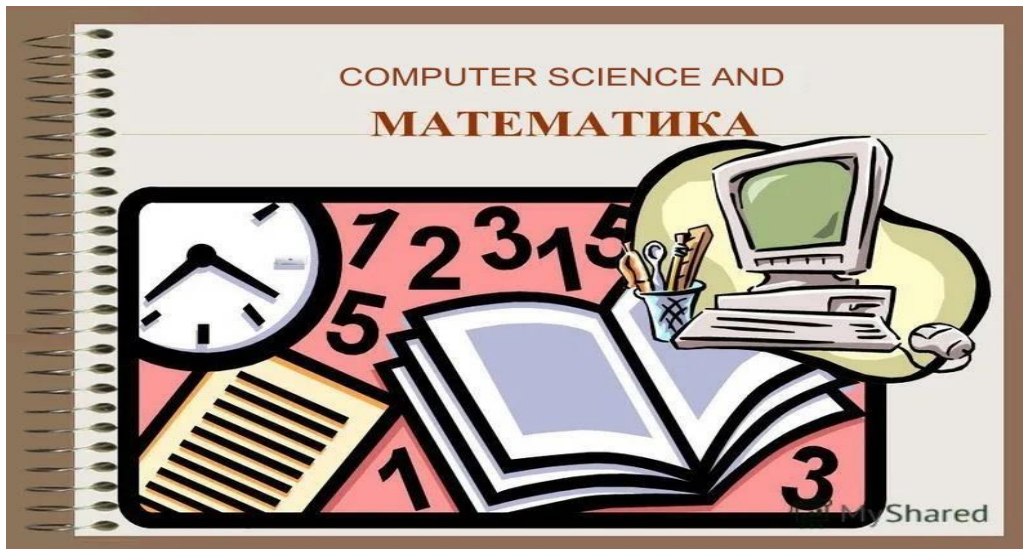
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**What is the importance of mathematics in computer science?**

Mathematics has probably been the bane of many students' lives (including mine!!!) since its inception. On the other hand, computer science is very interesting, and students study it in the hope of becoming the next programming prodigy!!! Is computer science really that simple?!! No, my friends, this is not true... Computer science is actually closely related to mathematics.

Over the years, there has been much debate about the importance of mathematics in computer science.

Some consider it to be a slight extension of computer science, others believe it is (mostly!) based on computer science. According to Oxford University:



Why is mathematics so important in computer science?

Imagine the Burj Khalifa (the tallest building in the world). So what's the most important thing about this building? No, it's not about the height (well, that too!), but mainly about its foundation. If the Burj Khalifa did not have a strong foundation, it would have swayed violently and fallen harder than it stood!!

So, if you're interested in this off-topic story, mathematics is the foundation of computer science. In fact, we can say that computer science is a part of mathematical sciences in general.



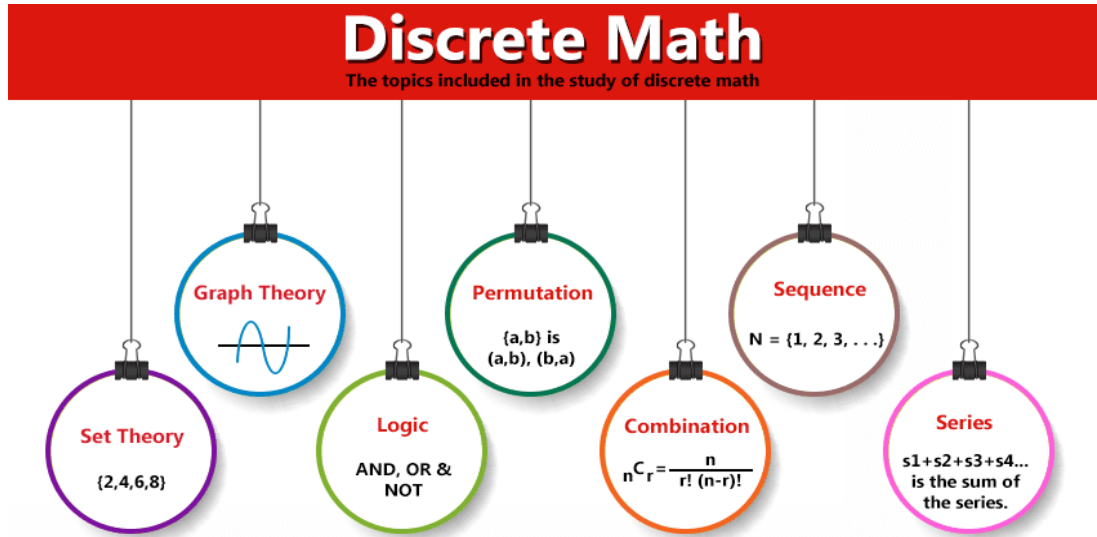
How so? Well, below are some points that illustrate this:

1. Discrete mathematics - the basis of computer science

Have you heard of logical notation, set theory, combinatorics, graph theory, probability theory, number theory, algebra, etc.?

Don't be discouraged, it's all part of discrete mathematics, as well as the basics of programming and computer science (i.e. you should study them for

computer science!!!). An example of this is algebra. Logical algebra is used in logic gates and relational algebra is used in databases. If you need another example, number theory has many applications in cryptography and cryptanalysis.



2. Mathematics teaches you how to use algorithms.

Algorithms are a fundamental part of computer science, and you've probably heard of them one way or another (if not... you need to learn more!!!). Essentially, it is a program or set of instructions that directs the execution of a program.

So where did you first apply the algorithm? It wasn't a computer science lesson, it was a math lesson! Don't believe me?! So, "2 + 3 = 5" is the basic algorithm you learned in math class that shows the sum of 2 and 3. Mathematics is essential for learning the basics of using advanced algorithms in computer science.



3. Mathematics provides essential analytical skills in computer science.

Analytical skills are required for problem solving and data analysis. And think about where you first applied these skills? Mathematics!!! Yes, mathematics always forces you to analyze your equations and understand the

derivative process in case of errors. This error must be corrected to obtain a final solution.

This will give you a lot of analytical skills that you can later use to find and fix errors!!! Although there are modern tools that can do this automatically, the experience and knowledge gained from developing and debugging programs is invaluable.

Mathematics -

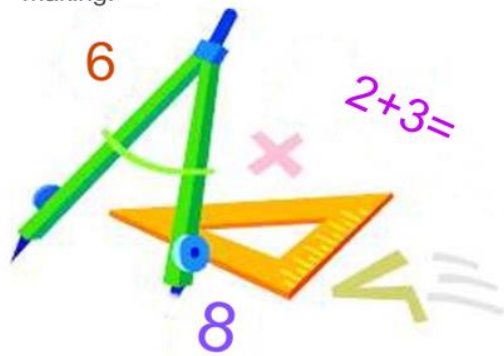
the science of structures, order and

relations, which historically developed on the basis of the operations of counting, measuring and describing the shape of objects.

Computer science -

science of methods and processes

collection, storage, processing, transmission, analysis and evaluation of information using computer technologies, ensuring the possibility of its use for decision-making.

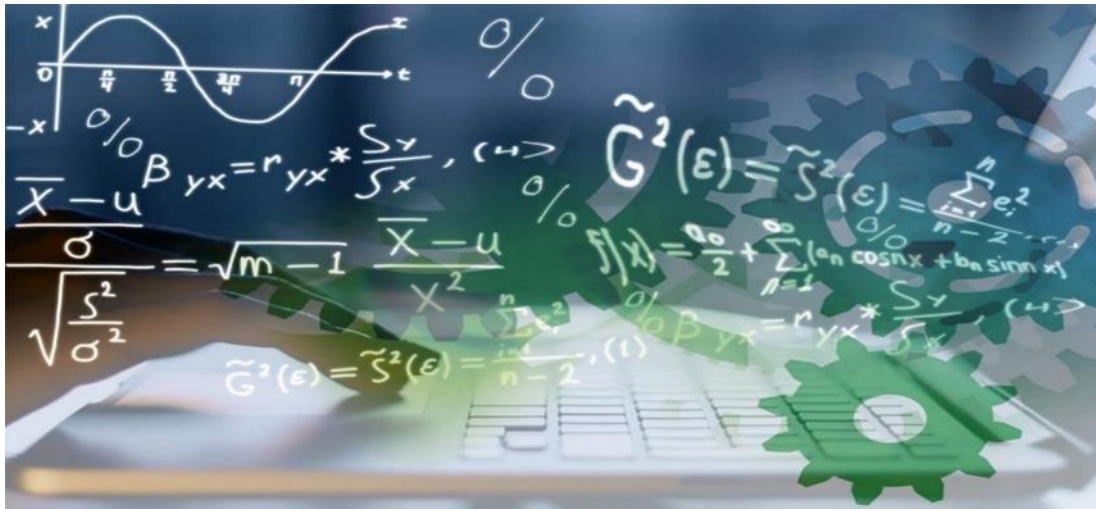


4. Many computer science disciplines require mathematical concepts.

Computer science is an umbrella term that includes many disciplines such as operating systems, databases, networking, artificial intelligence, embedded systems, data analytics...need I go on? !!

While there are subjects that can be studied with minimal math knowledge, most require at least an advanced degree.

For example, fields such as artificial intelligence and machine learning require a deep understanding of mathematical concepts such as linear algebra, multivariate calculus, probability, and more. (And this is what makes math so important!!!).



CONCLUSION

Is math really necessary for computer science? Well, some say it's work related. For example: creating a food blog does not require any knowledge of mathematics. But creating a successful blog is a completely different matter. To do this, you need to focus on audience preferences, topic popularity, article ratings, etc. And you know what?...All this requires mathematics. So yes... Computer science is based on mathematics. And if you want to succeed in any computer science, you better develop a love for mathematics because it will help you a lot.

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