Automata and Computation Theory
Learning Paragraph Writting 1
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Question: Do you think formal, mathematical proofs are necessary in computer science? why or why not?

Answer:

I do think that formal mathematical proofs are necessary in computer science. It is definitely not necessary for the average implementation purposes of software development and there are things in computer science which are efficient only through practice and is unknown why theoretically it is better. Despite this there are some things that do need the mathematical proof such as for making sure algorithms work properly and Cybersecurity is actually practically unbreakable. For the algorithm example it is important to know that the algorithm accomplishes what you want it to accomplish when used correctly. Without mathematical proof it is hard to know that the algorithm you will use will actually accomplish what it claims to do. For specific examples there are algorithms that accomplish a tough goal efficiently a certain percent of the time. One needs to use mathematical proof to show that the result works most of the time. In the case of Cybersecurity, one of the reasons that most implemented systems can be hacked is because they don't use hashing algorithms or other algorithms that are proven to be unbreakable and try to implement their own. On the other hand another common reason for hacking to work is that the programmers implemented and algorithm incorrectly. It is important to not just prove mathematically an algorithm works but to also make sure you implement it correctly. So for the average case I would not say a computer scientist uses mathematical proofs, but as a field in whole it is impossible to move past a point without proving the validity of things with mathematical proofs.