Balaji Viswanathan answered the question of why is programming and coding so hard by asking, "Is surgery hard? Are designing spaceships hard? Just like surgery and aeronautical engineering, programming involves a complex art and science." I think that this is an excellent answer to the question posed as the topic of this essay.

My first experience learning to program was in high school and the language was Pascal. While I learned how to write and debug programs, I never really grasped it completely. During that time I was also learning to play guitar and spent hours a day practicing and playing. Playing music awoke my creativity. Even if I was simply learning a new song, I would spend hours listening and working through the notes and finding patterns for how it was played. At the time, I didn’t realize that learning to program requires that same focus.

Josh Kaufman, author of the book, ‘The First 20 Hours: Mastering the Toughest Part of Learning Anything’ gave a TED talk where he not only overturns the concept of it taking 10,000 hours to learn something new, but demonstrated that you can gain competency of a new subject in as little as 20 hours. The link to the TED talk is here, and it’s truly excellent. I think that the key concept of this talk is that the first 20 hours of learning something new is focused on the mechanics of it – the science. Once you breakthrough the 20-hour barrier, you’ve entered into a world where you can appreciate the art of it. I believe that what makes learning to program so hard is the student’s perception of that initial 20 hours.

In our case, over 159 thousand people are enrolled in this course. Some of us were here at the beginning and have already invested the time attending the lectures, doing homework, and taking the quizzes. Others who have registered later now have to invest the time to catch up to the current material. Over the course of this initial four weeks, we’ve already put in somewhere between say 8 and 16 hours – based on the course description – into learning this subject. With 7 weeks remaining in this course, we’ll invest another 14 to 28 hours of time spent focused on learning to write and debug Python code. Collectively, if the student makes it through the course, they’ll have only spent as little as 22 hours learning this new skill.

My point is that some people will never breakout of the critical first 20 hours. This may be because they are able to complete the coursework quickly and don’t spend time writing code outside of class. Some students may feel that they aren’t seeing results fast enough, so they become bored and quit. In other words, their perception of learning to program is a task – something that can be completed and then forgotten. So the student’s approach to learning never appreciates the art of the skill and only focuses on the science, or mechanics, of how it’s applied.