Without a deep understanding of the subject , I decided to apply business initially. However after Having studied economics , I felt like this subject requires a lot of memorization and the the theories being taught are far from the reality and often rarely offer little insight into how the real business are conducted. Later I found out that, it is the pitfall for the subject as a the whole , so I gradually lost interests.

While in the summer of 2018 , I attended a summer school regarding to the computer science in the cambridge this was my first time experimenting programming and I was strongly attracted by the creative logics and the innovative spirit among the computer science courses. I was so impressed about the different methods to print out fibonacci numbers . The first one that came up in my mind is using recursion .We first create a function called fib(n) , n is the nth fibonacci numbers that we want to print out. then If n<=1, return n , else return fib(n-1)+fib(n-2). Finally, we used for loop to get ascending number of n and finally printed out fib(n). However , I realized that the recursive calls take up too much memory space and it’s time complicity is 1.618 to the power of n , which is very slow . Then , I found another method to handle it ,which is assigning a ,b=0,1 firstly and next using for loop to circulate the a ,b=b, a+b operation to form fibonacci number. The time complexity of this method is O(n) which is much faster than the former one .

After I coming back from the summer school , I took A-level computer science. However , I thought the A-level content wasn’t enough and I wanted to learn more extracurricular knowledge, so I self study by reading the ‘introduction to algorithms ‘ . At the beginning , I was quite confused about the divide and conquer topic because the way it solve the problem is totally different from human’ logic .Lets take sorting as an example , human are prefer to use insertion sort while sorting ,which means in iteration i, swap a[i] with each larger entry to its left until the end . However , the time complexity of the insertion sort is O( n squared) ,because there is a nested for loop and the inside and outside for loop both take O(n) ,so the total time complexity is O( n squared). It is quite slow compared to other sorting algorithms. After I searched information online and discussed with my teachers , I successfully figured out what is divide and conquer . It divides up problem into several subproblems and solve each subproblem recursively.Finally we combine solutions to subproblems into overall solution. Moreover, I learned some faster sorting algorithms involves the use of divide and conquer ,which is Merge sort and Quick sort .For merge sort , we recursively divides the list into two haves ( left and right ) until there is only one element in each array and then merge two halves to make sorted whole. Since it uses divide and conquer , so it’s time complexity( T(n) ) can be represented as 2T(n/2)+n. Therefore we can use binary tree to represent the time complexity . For each layer of the tree , the total time complexity is n and there are log n layers .Therefore the time complexity for merge sort is O( n log n ).When we consider the worst case , the time complexity is still O(n log n) . For quick sort , we choose a pivot ( a[j] ) and do partition so that no larger entry to the left of the pivot and no smaller entry to the right of the pivot, then we sort each piece recursively . It’s time complexity is still n log n, but for the worst case which is a list of number in descending order ,it needs O(n square) time and then I came up with another question . It seems like merge sort has less time complexity than the quick sort in the worst case , but why people are prefer to use quick sort? After I discussed with my teacher , I realized that the quick sort is an in-place sorting algorithms which means no extra memory needed ,while merge sort requires extra space to store the left and right sub-arrays. Apart from that , the worst case of the quick sort can be avoided by choosing the median among the first, middle and last elements as pivot .

In addition , I attended the ASDAN business simulation in 2017 , I recognized the importance of creativity and I learned how to express my ideas logically and explicitly .Apart from that , in the year of 2017, I got gold certificate in UKMT senior mathematical challenge , and Distinction In Galois contest.

When my finish my degree , I probably choose to take postgraduate courses of computer science.

Also, I would like to study machine learning and write some algorithms to apply it in the reality .