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Underdeveloped Industry in Turkey: Reality of Insufficient Computer Scientists

In today's business world there is a big deficiency in qualified computer scientist. It has influence on the whole industrial activities in our country. When computer scientists in foreign countries are compared with those in Turkey, there is a significant difference between them. Is computer science abroad different from the one in Turkey? The answer is obviously no. To be a qualified computer scientist, there are two main factors, which are also the fundamentals of computer science. These are algorithms and electronic knowledge, which must to be known by every computer scientist or engineer very well.

To start with, people who want to be one of the best computer scientists in the world need to have good sense of algorithms. To solve that problem, it is more useful to start with learning some basic algorithms that were found before. Combining these basic algorithms helps to create more efficient solutions. For example, combining Djikstra's .converting prefix expressions to postfix expressions and simple addition algorithms helps computers to calculate the sum in a short time. Knowing basic algorithms also prevents computer scientist from rediscovering America. In other words, you do not have to find new solution to solve the same problems. For instance, if the problem is sorting the elements into a set, you can choose one of the heapsort, bubblesort, quicksort algorithms depending on the magnitude of the problems. Learning calculus is also seen one of the most important aspect of being a computer scientist when creating algorithms. Calculating statistics usually requires some calculus theorems. First you collect some data and then you try to formalize the data according to these theorems. Actually problems' solution lies in the details of calculus. The generalizations of these solutions are called math formulas. These formulas, like the sum symbol in math, can easily be expressed as an algorithm. The sum symbol, $\sum$, uses one variable (k) which changes at the every step of process, and start (i), end (n) values of a set of consecutive numbers. Well, the algorithm can be expressed as: initially k is i and sum is 0. Add k to sum and then increase the k term one by one. Do it until k equals n. Expressing formulas as algorithm can be as easy as this.

In the second place, understanding how electronic things work makes you a computer scientist. It takes really long time when you use computer to calculate without knowing how it does. It is possible to make computer calculate with a trial and error method, which is time-consuming and not very efficient. However, if you know how it calculates, you are able to write the most efficient program for computer because it depends on the physical properties of the CPUs. This knowledge distinguishes a computer scientist from a programmer. In most cases, a programmer does not know what is happening in the background of her or his program. It is enough to know if the program gives the right output for specific inputs. The efficiency is not so important for them. Thinking like a computer by learning how electronics work is another thing which helps computer scientist in the software world because computers behave like a foreign person in the programming steps. While communicating with a foreign person, you try to choose the best words to avoid misunderstanding. Similarly, if you think like a computer, you are more likely to use the best statements while writing an efficient program, and you will be able to see other possible solutions. In this thinking step, you can see the extreme points for computer, which helps you to develop solutions in order to avoid the errors.

On the whole, algorithm and calculus cannot be separated from each other. Yet, these two cannot be sufficient to be qualified without electronic knowledge. A programmer can also write programs like computer scientist without knowing the inside world of computer. To be called a qualified computer scientist, it's compulsory to have more knowledge than a programmer. The lack of competent computer scientists is not seen by the government in Turkey. Unless they take precautions, those who are competent will leave the country, and brain drain will increase. Thus, academicians and officials should take the responsibility to train well-equipped computer scientists to develop the industry of Turkey.

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