



## Algorithm Learning

The first number is 2. The second is 4. The third 6. What is the next number? The answer is 14. The solution is the following formula:  $x^3 - 6x^2 + 13x - 6$ . But if you ask anyone this question, everyone will answer 8. But why 8?

Machine Learning is one of the technologies that has made the most impact in recent years. In particular deep learning has shown some remarkable results.<sup>1</sup> However, deep learning models are data-hungry and seemingly simple problems as above are already difficult for them. This is an old and nascent pursuit in AI. However, with the increase of the computation power this area, similar to deep learning, is becoming more and more approachable. In this thesis, we want to see what are the limitations, and how one can approach this problem.

The solution in the first example is “8”, because it is the most simple one. It is much easier to write the following algorithm than any other algorithm that produces the same results.

```
for i in range(n):
    print (2*n)
```

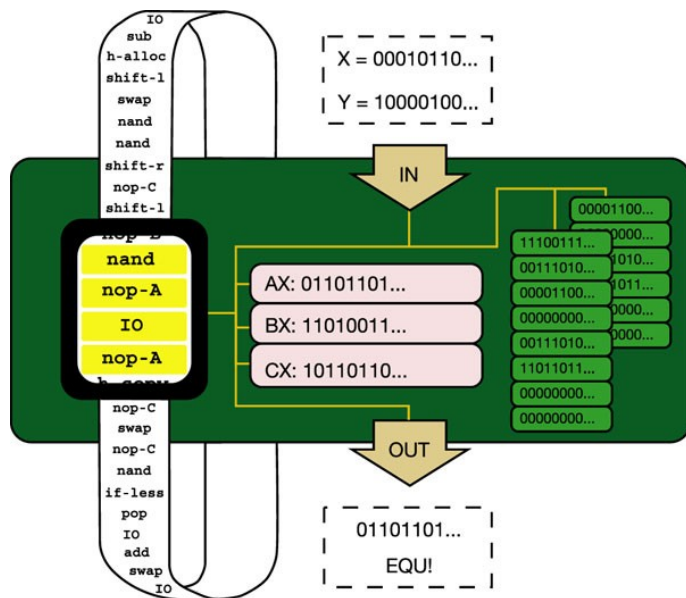
Based on this idea, we have started to build a framework where different methods for searching *simple* algorithms can be implemented.

**Requirements:** Prior experience or a strong interest in programming (in Java). Creativity skills are advantageous. Note that the core of the current setup is implemented in Java.

**Interested? Please contact us for more details!**

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<sup>1</sup>Give some examples like, AlphaZero, AlphaFold and so on.