A.I. Problem Solvers with Human Prize Winners; Humanity's Ingenuity and its Role in the Future of A.I.

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Victor Taelin, Brazilian startup founder and arguably an expert in the field of Artificial Intelligence (A.I.) with many years of experience, posed a challenge to his followers[1]. Solve a simple puzzle, transforming simple sequences of symbols into other simple sequences based on easy to understand rules. Solve this, and win a whopping $10,000 USD. Go ahead and see if you can solve it yourself, I'm sure you can.

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A::B is a system with 4 tokens: `A#`, `#A`, `B#` and `#B`.

An A::B program is a sequence of tokens. Example:

    B# A# #B #A B#

To *compute* a program, we must rewrite neighbor tokens, using the rules:

    A# #A ... becomes ... nothing
    A# #B ... becomes ... #B A#
    B# #A ... becomes ... #A B#
    B# #B ... becomes ... nothing

In other words, whenever two neighbor tokens have their '#' facing each-other,
they must be rewritten according to the corresponding rule. For example, the
first example shown here is computed as:

    B# A# #B #A B# =
    B# #B A# #A B# =
    A# #A B# =
    B#

The steps were:
1. We replaced `A# #B` by `#B A#`.
2. We replaced `B# #B` by nothing.
3. We replaced `A# #A` by nothing.
The final result was just `B#`.

Now, consider the following program:

A# B# B# #A B# #A #B

Fully compute it, step by step.
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Image courtesy of @VictorTaelin

This is a "braindead question that most children should be able to read, learn and solve in a minute,"[2] (Taelin's words)

So what was the catch?

To win the prize, you needed to develop an A.I. prompt for the famous ChatGPT that solved it for you. This problem is incredibly simple for a human to solve, yet due to tokenization, the way words and symbols are represented, stored, and processed by the A.I., (Think of tokenization like little moving boxes to store parts of your furniture during a move, but with words) works it seemed tremendously difficult for current large language models to solve.

Results came back inconsistent and garbled and failed to account for the rules of reality.

Taelin, confidently exclaimed “whenever you find yourself trying to explain why GPTs will never reach AGI - just show them this prompt,”

GPT: Generatively Pretrained Transformer, which is simply just a fancy type of A.I. that specializes in paying extra attention to the important bits of a problem.

AGI: Artificial General Intelligence, the idea that A.I. can begin to train itself and learn exponentially.

But two days later, Taelin revealed that not one, a brilliant individual had found his golden goose: a prompt which achieved a near 100% success rate[3] on the problem. The problem had been solved, and in record time. It worked by rigorous demonstration of all problem states, and by deeply diving into how to translate the problem into a form that the tokenizer could recognize[4].

But the question nearly asks itself: why on Earth did Taelin, an A.I. expert, feel so confident as to offer up $10,000 USD yet be so quickly

disproved? If our so-called A.I. experts can be so confident as to offer up massive sums of money supporting claims about A.I., how can we be confident that anyone really knows the future of A.I.?

In 2020, the *MIT Task Force Report on Automation* was published. In this report, chapter 3, titled "Technology and Innovation" promptly dives headfirst into the topic of A.I. It discusses how "Flexibility in dynamic environments remains a key human attribute still largely out of reach for machines," some time later the report offers up that " Flexibility in dynamic environments remains a key human attribute still largely out of reach for machines," This article was written two years before the 2022 boom of A.I. tools, yet still very clearly rings true 4 whole years later. Human ingenuity and the flexibility to understand the problem, the tokenizer, and specify the question in a way the A.I. could understand clearly allowed for the problem to be solved. This was not some notable improvement of automation capability, nor was it the replacement of jobs. It was the very human attempt to understand and break the limits of a specialized A.I. To Taelin, $10,000 lost may be worth $10,000 gained in a deeper understanding of this new, and exciting technology.

There are two morals of this story: 1. Not even experts can be confident about what the future has in store for A.I. and 2. it requires human ingenuity on top of A.I. tools to really bring out the best that A.I. has to offer. Even if some jobs get replaced, creativity and problem solving work are still graciously rewarded in the field of A.I. (sometimes even monetarily!)

Sources:

[1] https://twitter.com/VictorTaelin/status/1776677635491344744
[2] https://twitter.com/VictorTaelin/status/1776096481704804789
[3] https://twitter.com/VictorTaelin/status/1777049193489572064
[4] https://twitter.com/futuristfrog/status/1778109834509832462