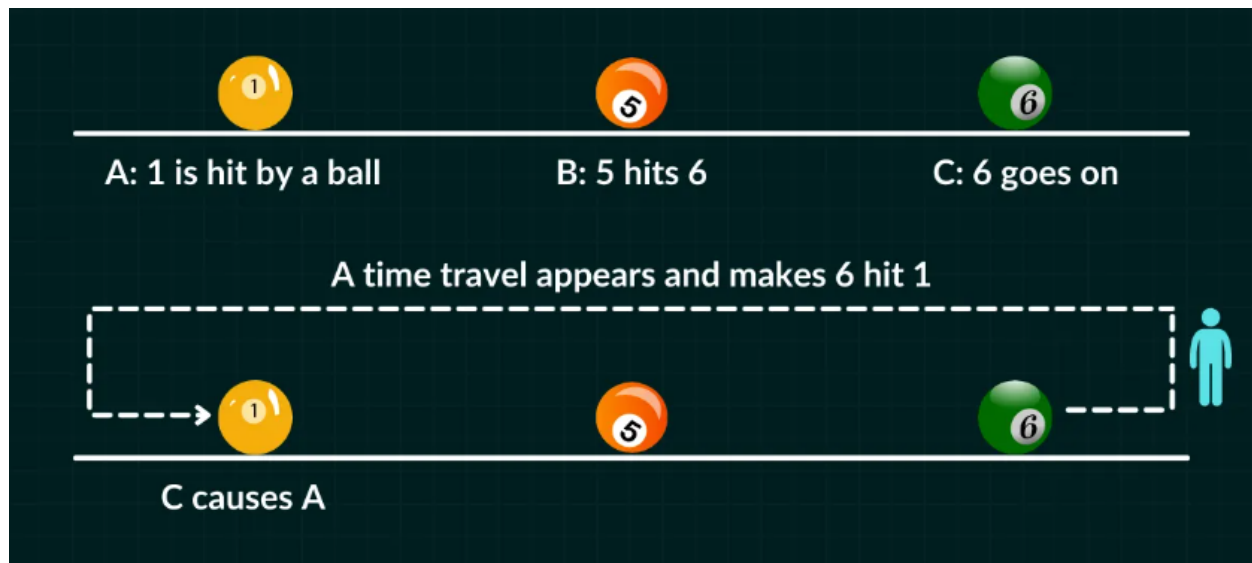# BootStrap Paradox

What is BootStrap Paradox?

The Bootstrap Paradox is a theoretical paradox of time travel that occurs when an object or piece of information sent back in time becomes trapped within an infinite cause-effect loop in which the item no longer has a discernible point of origin, and is said to be "uncaused" or "self-created". It is also known as an Ontological Paradox, in reference to ontology, a branch of metaphysics dealing with the study of being and existence.

An Overview

Bootstrap Paradox: We all know Albert Einstein, Isaac Newton, Erwin Schröndinger, and maybe even more so, we know their legacy, what they left us and the world. So let us imagine that we were able to travel back in time to meet these geniuses, maybe ask them about their work, exchange a few words or two about their recent breakthroughs, but as we arrive, the name Einstein is unknown all, non-existent.

Having brought from the future the memories of Einstein's work and their specificities, a man who now does not exist, we start to publish it ourselves, feeding our future selves the reason we came back to the past in the first place. Therefore, it appears that we are stuck in an endless

causal loop: the works of these scientists caused us to go back in the past, yet we are what created them. And here, we have a paradox, the bootstrap paradox.

Example

In one sentence, the bootstrap paradox distorts our understanding of cause and effect. Let us set up a linear timeline of events A (we hit a pool ball numbered 1), B (1 hits another ball numbered 5), and C (5 hits the next ball numbered 6 and 6 goes on), where time passes in a straight line from A to C, from the past to the present, and then the future, each event consecutively causing the next as shown above. A causing B, B causing C. In this "normal" and logical case, concordant with how we understand our world, the future is uncertain and dependent on our actions in the past and present. However, when a time traveler is introduced and brings information from C to influence or cause A (6 hits 1), this chain of casually interlinked events is distorted. In short, the bootstrap paradox exists where C causes A, where information, people, or objects from the future cause the past.

Implications of the Bootstrap Paradox

Indeed, the implication of this breach in the causality loop is heavy. First, it implies that to fit with our linear understanding of time, the future event C has already happened at event A. This is thoroughly inconsistent. Furthermore, the concept of free will is greatly impacted. Indeed, the bootstrap paradox implies that all things are predetermined since the past is dependent on the future a shocking implication.
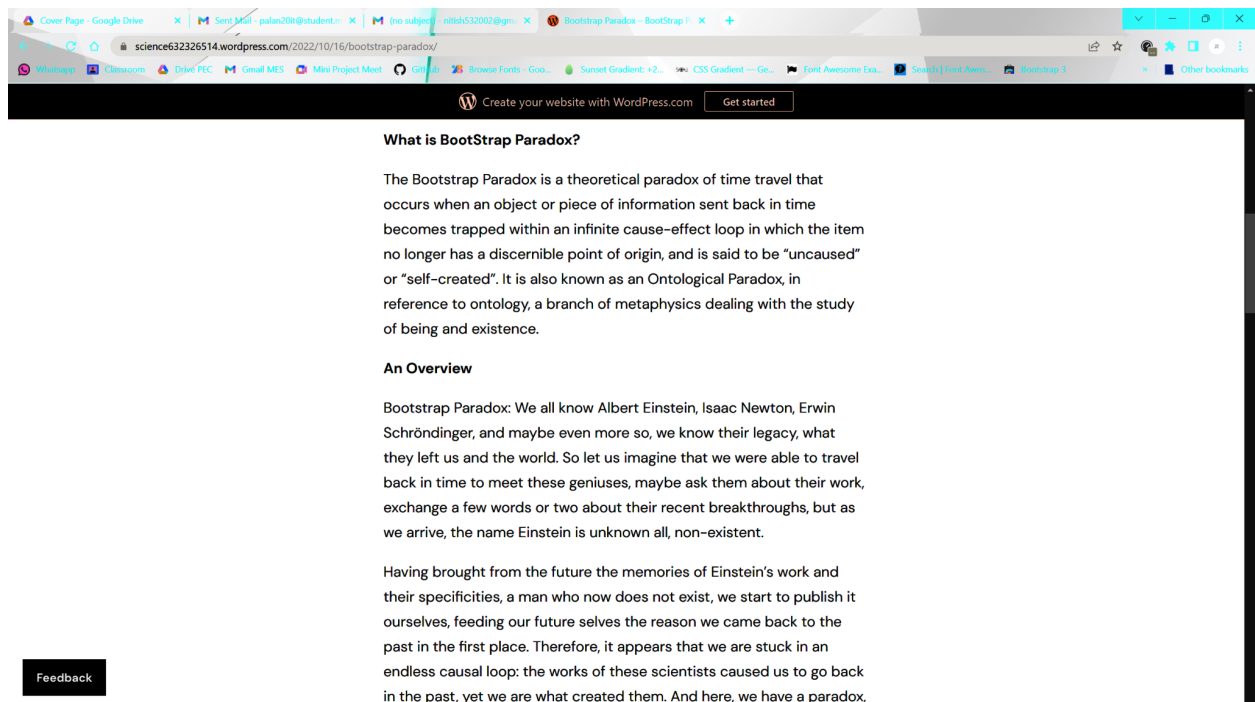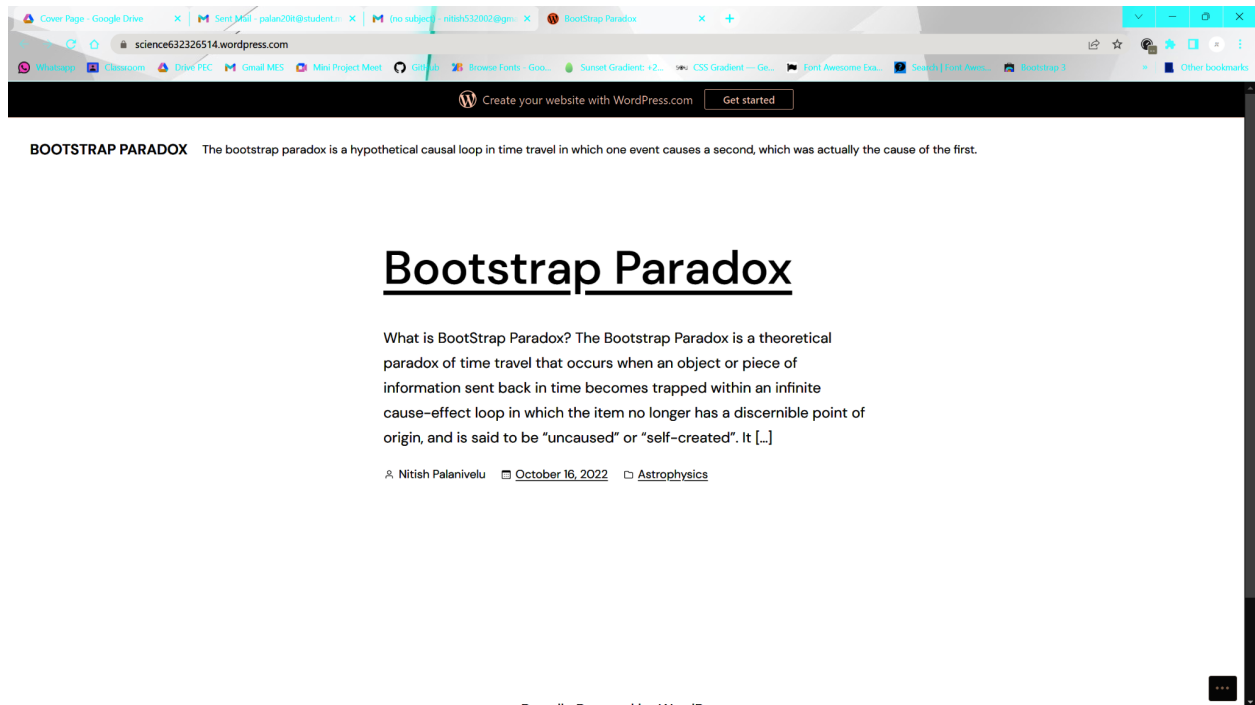
Physically speaking, the bootstrap paradox also appears to violate the second law of thermodynamics. The former states that the entropy of isolated systems will either remain constant or increase but cannot decrease when left to a spontaneous evolution. Following the law, the state of the object or information traveling back and forth should deteriorate.

Conclusion

The paradoxes don't stop here

To conclude, all of these situations remain hypothetical. However, much more paradoxes relating to time travel populate the world of physics. For example, the grandfather paradox, a logical problem, states that if you were to travel back in time, you could kill your own grandfather, causing a problem in your genealogy and your own existence. All seemingly absurd and bearing extravagant solutions, these paradoxes lead scientists like Stephen Hawking to believe that time travel is impossible.

Images of website

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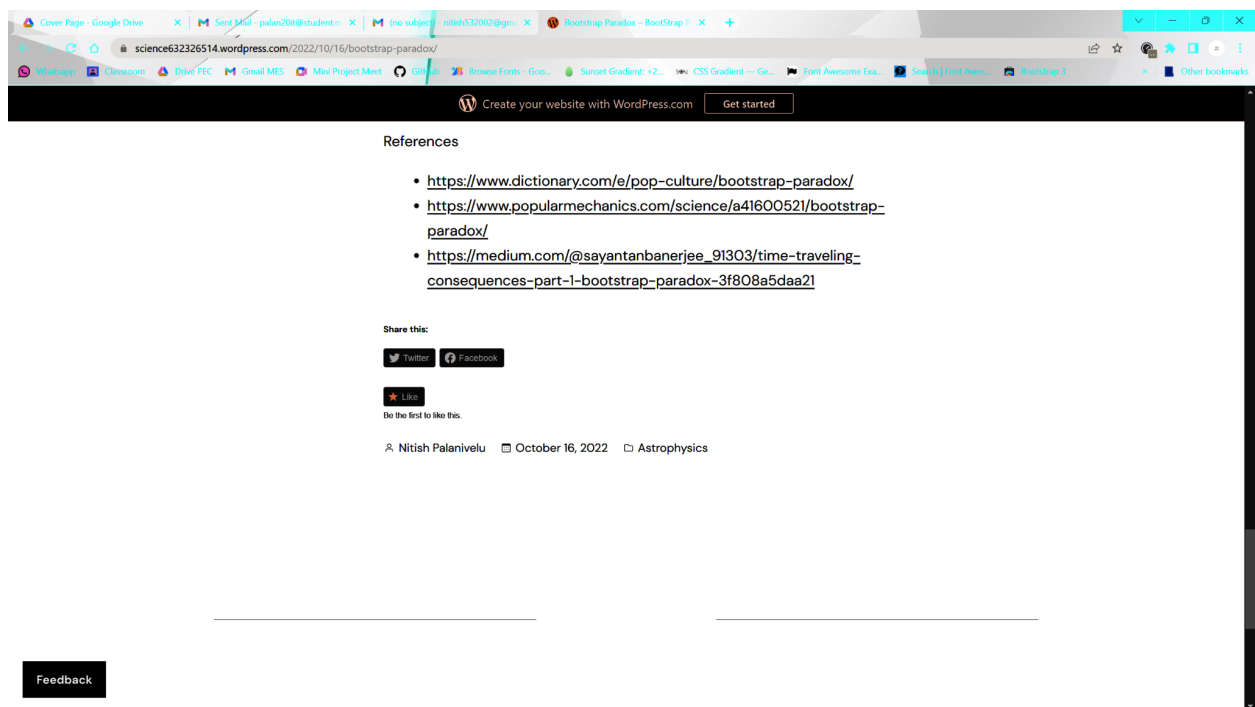
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