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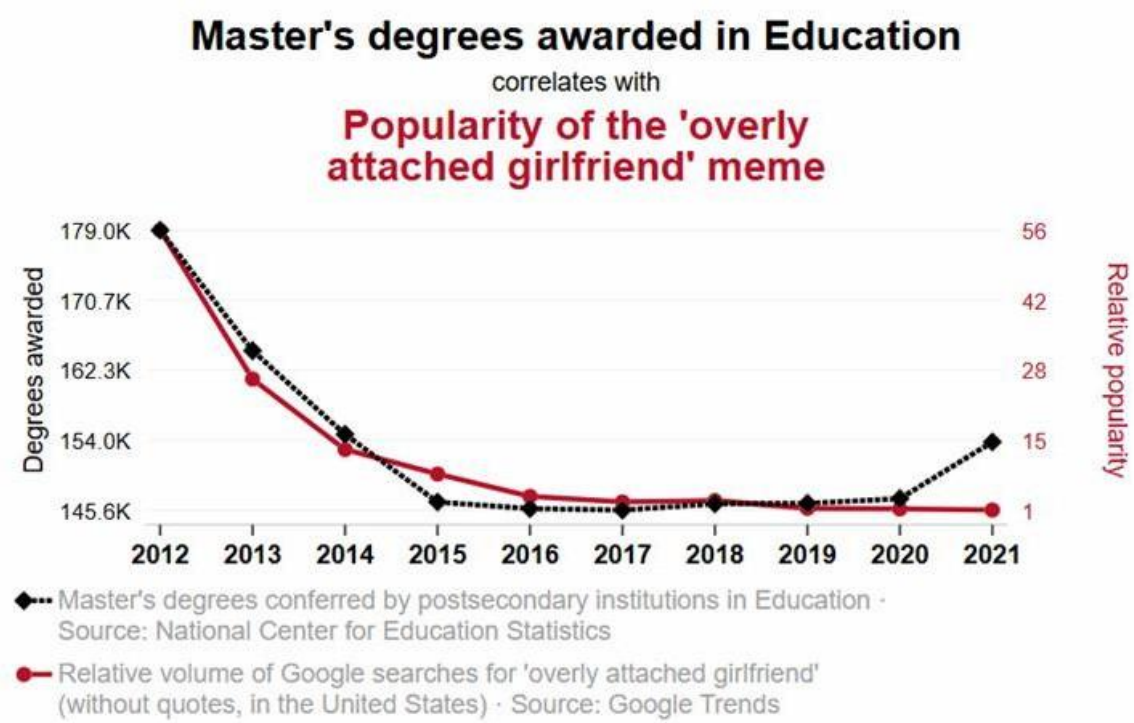
MACQUARIE University

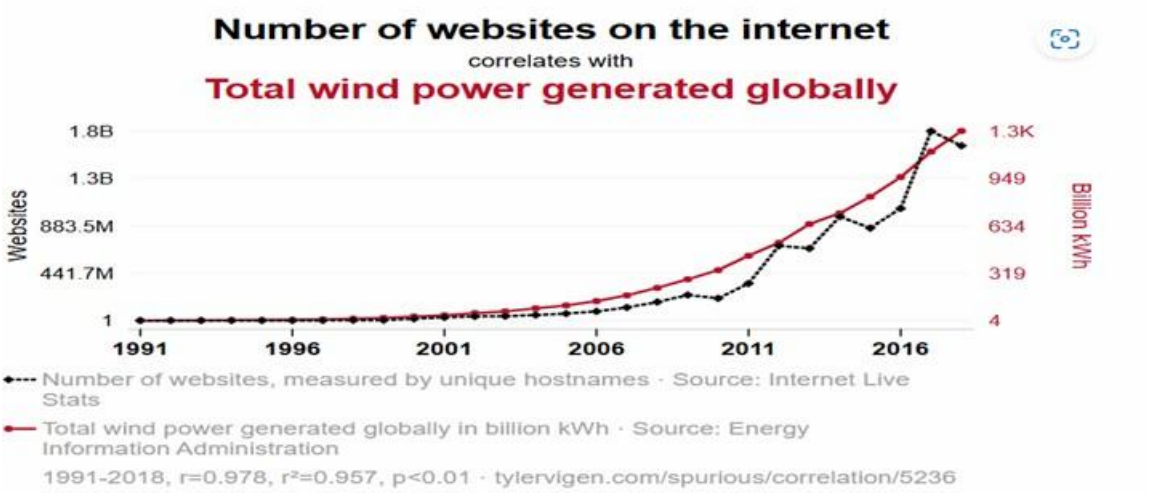
DATA SCIENCE WEEK 5 PRACTICAL

1. Master's Degrees in Education vs. 'Overly Attached Girlfriend' Meme Popularity:



This graph does not display any correlation between the number of master's degrees awarded in education and the popularity of the 'Overly Attached Girlfriend' meme. Regardless of the apparent statistical relationship, I do not notice any causal relationship between these two variables, and hence it highlights potentially misleading conclusions when interpreting correlated data from the graph above.

(b) Number of Websites vs. Global Wind Power Generation:



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This graph displays a correlation between the increasing number of websites and the total wind power generated globally. The comparison of these unrelated variables suggests that it is not possible to draw any conclusive relationship based solely on statistical correlation from the graph.

(c) **Popularity of the Name 'Tiffany' vs. Air Pollution in Los Angeles**:

This graph presents a correlation between the declining popularity of the name 'Tiffany' and improvements in air quality in Los Angeles.

The graph lacks logical connection or relationship between these two variables and the correlations seems purely by chance, without any underlying causal link between the two variables.

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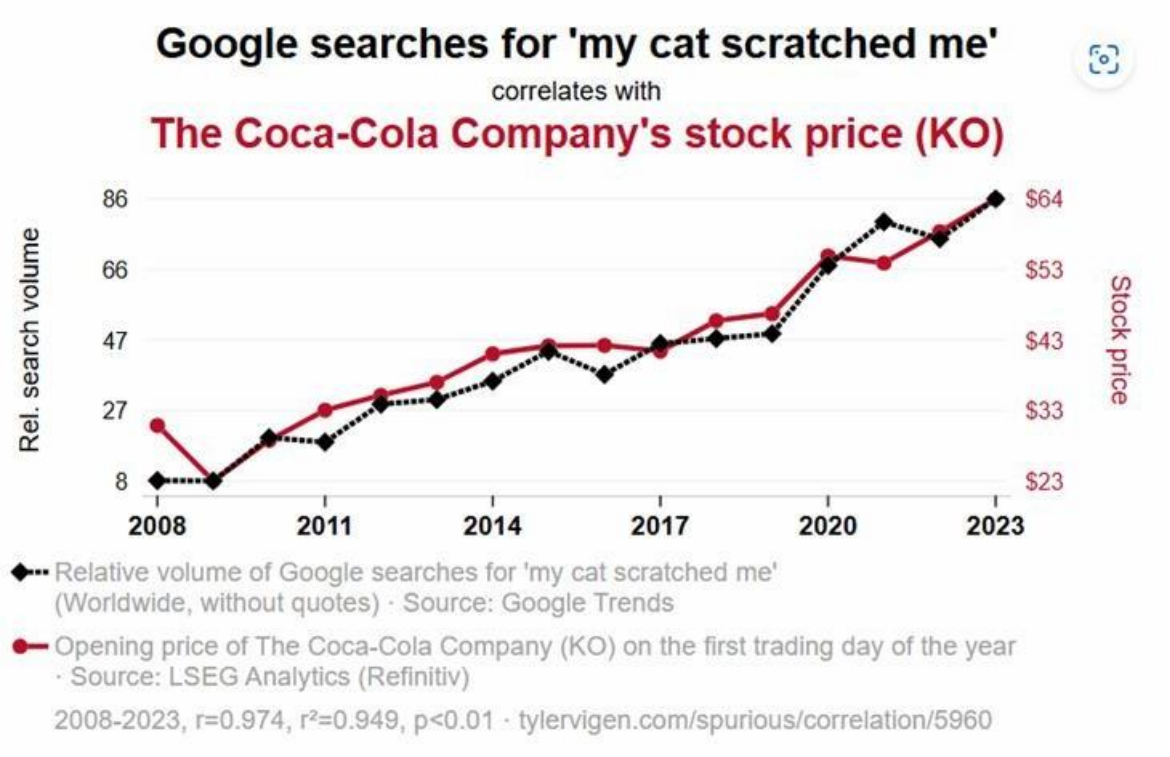
(d) **Google Searches for 'My Cat Scratched Me' vs. Coca-Cola's Stock Price**:



This graph illustrates a correlation between the frequency of Google searches for 'my cat scratched me' and fluctuations in The Coca-Cola Company's stock price. It seems highly obscure that this kind of pair is depicted, I do not see any logical relationship between the two variables and would like to conclude that this pairing emphasizes the importance of not inferring causation from correlation, as the two variables are clearly unrelated.

(e) **Robberies in Alaska vs. Professor Salaries in the US**:

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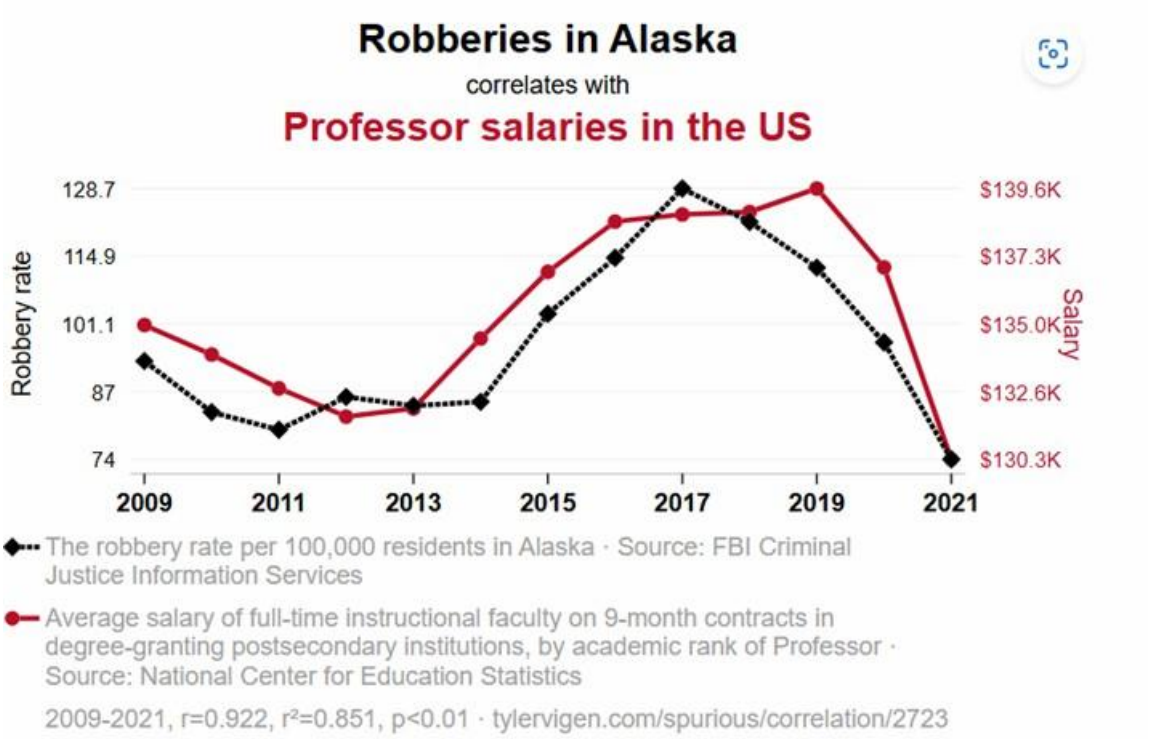

This graph shows a correlation between the number of robberies in Alaska and the average salaries of professors across the United States.

To me, it seems highly implausible to draw any conclusive logical inference between the two variables and to highlight a conclusion based solely on correlated data without considering potential causal mechanisms based on the nature of the above graph.

2. I often turn to generative AI models for a variety of tasks like research, writing help, brainstorming, and even coding support. The impact on society has been significant—AI has really ramped up productivity, helped students learn new skills, and made automation possible in many industries. On the flip side, though, artists and musicians have felt the pinch, as AI tends to mimic styles without giving credit or compensation to the original creators, which can undermine their professions. In fields such as education, law, medicine, and science, AI has the potential to boost efficiency by offering personalized learning experiences, aiding in legal research, improving diagnostics, and driving scientific breakthroughs. However, we can't ignore the ethical dilemmas, the risk of misinformation, and the potential for bias that comes with it. We need to weigh the advantages of AI—like increased accessibility, innovation, and automation—against the downsides, such as job loss and data misuse. It's crucial that profits are shared fairly, ensuring that those whose work helped train these models are compensated. While the development of AI is thrilling, we must prioritize ethical deployment. I would definitely consider a role in AI if the company emphasized transparency, fairness, and responsible innovation.

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3. I frequently provide personal information when applying for jobs, rentals, and financial services. I do understand that there is a potential for cyberattacks which could lead to my private information being violated.

Some of the best practices for data scientists include reducing the data collection and to anomalies in people's sensitive information, this could help ensure transparency in the decision-making stages. Models should be audited for bias, because auditing according to me is the most crucial step, with regular fairness checks, we could prevent indirect and unintended discrimination. If I was working for a real estate firm or bank, I would advocate for explainable AI, where applicants would need to deeply understand how decisions are made, ensuring models do not largely disadvantage certain groups, especially marginalized communities.

For government applications, fairness and accountability would be of utmost importance, as the decisions taken could directly impact lives quiet significantly. Strict oversight, public transparency, and ethical AI guidelines must be enforced to avoid systemic bias in an AI system. In conclusion, the goal of responsible AI is to prioritize fairness, security, and individual rights over the efficiency of an AI system.

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