Assignment 05

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Q1. => Let Route 1 be R1, Route 2 be R2, and Route 3 be R3.

We know following information about the routes

R1 {distance : 2 km, rocky: 0.5, sandy: 0.20, smooth: 0.30}
R2 {distance : 1.8km, rocky: 0.40, sandy: 0.40, smooth: 0.20}
R3 {distance: 3.1km, rocky: 0.10, sandy: 0.50, smooth: 0.40}

1. Part 1
   Time for R1 = (distance/speed) * probability
   = (2/2) * 0.5 + (2/3) * 0.2 + (2/5) * 0.3 = 0.5 + 0.13 + 0.12 = **0.75**
   Time for R2 = (1.8/2) * 0.4 + (1.8/3) * 0.4 + (1.8/5) * 0.20 = 0.36 + 0.24 + 0.072 = **0.672**
   Time for R3 = (3.1/2) * 0.1 + (3.1/3) * 0.5 + (3.1/5) * 0.4 = 0.155 + 0.516 + 0.248 = **0.918**

   Based on available data, we should take route 2.

2. Part 2
   With new information
   Time for R1 = 0.75 + (45/60) * 0.3 = 0.75 + 0.225 = **0.975**
   Time for R2 = 0.672 + 1 * 0.6 = **1.272**
   R3 = **0.918**

   Based on previous and new information, we should take route 3.
3. Part 3
   With new information
   New time for R3 (if R3 is smooth) = (3.1/5) = **0.62**
   Time for R3 (if R3 is not smooth) = 0.918

   Weighted average EU = 0.918 * 0.60 + 0.62 * 0.40 = **0.7988**

   Now
   Value of information = Original time - weighted average gives us
   0.918 - 0.7988 = **0.1192**

   Convert to mins
   0.1192 * 60 = **7.152 mins**

   Value of information = **7.152 min**
   We can wait for **7.152 minutes** for this information.

4. Part 4

ChatGPT was able to answer Q1 correctly. It was able to do the calculations accurately here.

For Q2, I am surprised that it made a simple mistake in comparison. I think the context played some part here. GPT must have thought Route 3 has no new information so it should not be considered, and so it answered Route 1 as the best path.

> Q2. Now which route should we pick?
>
> Now, we need to consider the additional time due to the crater and the bridge. We add the additional time multiplied by the probability of the event to the expected time.
>
> For Route 1:
>
> Expected time = 0.75 hours + 45 minutes * 0.3 = 0.75 + 0.225 = 0.975 hours
> For Route 2:
>
> Expected time = 0.672 hours + 60 minutes * 0.6 = 0.672 + 0.6 = 1.272 hours
> For Route 3:
>
> Expected time = 0.918 hours (no additional information)
> So, based on the updated expected time, Route 1 should be picked.

For Q3, As GPT had made a mistake in Q2, it calculated the value of information using the time required from route 1 - time required from route 3. So basically mistake from Q2 was propagated in Q3 too. Also to calculate the value of information GPT used a different method.

> Q3. Now suppose that we can use a satellite to find out whether the terrain in route 3 is smooth. Is this helpful? What is the value of this information? Expressed differently, how long are we willing to wait for this information from the satellite?
>
> If we know the terrain in route 3 is smooth, the time will be 3.1 km / 5 km/h = 0.62 hours, which is less than the expected time of Route 1 (0.975 hours). So, it is helpful.
>
> The value of this information is the difference in time between the expected time of Route 1 and the time of Route 3 if it is smooth, which is 0.975 - 0.62 =

0.355 hours or about 21.3 minutes. So, we are willing to wait up to 21.3 minutes for this information from the satellite.

Q4 =>

1. =>
   Big Tech has an advantage in AI:

   Data Advantage: Big Tech firms have access to a large amount of behavioral data through surveillance. This data helps them create better AI products. These companies have become essential infrastructure in many industries, including health, consumer goods, education, and credit.

   Computing Power Advantage: AI is a data-driven field that requires a lot of computing power. Only a few companies have the resources to build their own infrastructure for this. This means that many AI startups depend on Big Tech for server infrastructure.

   Geopolitical Advantage: AI systems are seen as strategic economic and security assets. The narrative around the US-China AI race positions AI companies as crucial players. This ensures that Big Tech continues to accumulate resources and political capital.
2. =>
   AI Now believes it's important to focus on Big Tech for several reasons:

   Big Tech companies are often at the root of major issues like invasive data surveillance, manipulation of autonomy, economic power consolidation, and exacerbation of inequality and discrimination. The business and regulatory practices of Big Tech have significant effects on the wider tech ecosystem, pushing other companies to adopt similar practices. Also, many sectors, including the tech industry and government, heavily rely on Big Tech. This makes these companies a potential single point of failure.

   During the pandemic, the dependence of governments on Big Tech for basic functions became particularly evident. The report also aims to challenge the narratives that justify and normalize the practices of these companies, such as unrestricted innovation and platformization being necessarily beneficial to society.

3. => "Algorithmic Accountability" refers to the idea that companies should be responsible for the outcomes of their AI systems. This means they should ensure their systems are not causing harm, rather than waiting for regulators or the public to identify and address these harms.

   Shifting the responsibility for detecting harm to the companies themselves is important because it encourages companies to prevent harm before it occurs, rather than addressing it after the fact. Not only that, but also It's more efficient for companies, who

have intimate knowledge of their systems, to identify potential issues. Furthermore, It places the burden of proof on the companies, who are profiting from these systems, rather than on the public or regulators. The impact of harmful AI systems can be widespread and severe. By making companies accountable, we can mitigate these impacts. Additionally, it aligns with how we regulate other impactful goods, like food and medicine, where firms must demonstrate compliance with laws. In essence, it's about making sure companies are doing their due diligence to prevent harm from their AI systems.

4. => The document suggests several ways to address the challenges posed by Big Tech and AI. These include limiting data collection, connecting privacy and competition law, reforming merger guidelines, enforcing competition laws, passing antitrust bills, mandating documentation requirements, enforcing public accountability, scrutinizing regulatory claims, imposing structural curbs on harmful AI, developing biometric regulation rules, and establishing worker protections. The effectiveness of these actions can vary, but enforcing competition laws, reforming merger guidelines, imposing structural curbs on harmful AI, and establishing worker protections could be particularly impactful. They have the potential to directly address the concentration of power in Big Tech and provide significant benefits for individuals in the workplace. However, a combination of these actions will likely be necessary to effectively address the challenges posed by Big Tech and AI.

5. => I agree with the assessment that artificial intelligence is not an inevitable progression, because it's a human-made tool, and its development and use are guided by human decisions. The quote in the article is trying to say that AI isn't something that just happens on its own. It's a tool we've created, and it's up to us to decide how it's used. If we're not careful, AI could lead to problems like increasing inequality or harming people's health. So, it's important to learn about AI, think critically about it, protect personal data, support ethical AI practices, and join in discussions about AI. By doing these things, we can help make sure AI is used in a way that's good for everyone.