

## Assignment 5

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Part 1: Our Mars rover has been out collecting samples, and it needs to return to the charging station as quickly as possible.

milestone: start this after Monday 10/30 lecture

It knows that over rocky terrain it can go 2 km/h. Over sandy terrain it can go 3 km/h, and over smooth terrain it can go 5 km/h.

There are three routes it might choose from. Unfortunately, our terrain data for the three routes is incomplete, so we only have estimates.

Route 1 is 2 km long. There is a 20% chance it is sandy, 30% chance it is smooth, and a 50% chance it is rocky.

Route 2 is 1.8 km long. There is a 40% chance it is sandy, a 20% chance it is smooth, and a 40 % chance it is rocky.

Route 3 is 3.1 km long. There is a 50% chance it is sandy, a 40% chance it is smooth, and a 10% chance it is rocky.

(10 points) Which route should we pick? Show your work.

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$$\text{Route 1: } (0.2 * (\frac{2}{3})) + (0.3 * (\frac{2}{5})) + (0.5 * (\frac{2}{2})) = 0.75\text{hrs}$$

$$\text{Route 2: } (0.4 * (\frac{1.8}{3})) + (0.2 * (\frac{1.8}{5})) + (0.4 * (\frac{1.8}{2})) = 0.67\text{hrs}$$

$$\text{Route 3: } (0.5 * (\frac{3.1}{3})) + (0.4 * (\frac{3.1}{5})) + (0.1 * (\frac{3.1}{2})) = 0.93\text{hrs}$$

We should pick Route 2.

Part 2:

We have now found out some additional information.

Route 1 contains a crater. If the wall of the crater is intact, we can go through it. If the wall has been damaged, we will need to go around, which will add 45 minutes to our journey. There is a 30% chance that the wall is damaged.

Route 2 contains a bridge. If that bridge is damaged, we will need to repair it, which will add 1 hour to our time. There is a 60% chance that the bridge is out.

(10 points) Now which route should we pick? Show your work.

- In this case, if we consider route 1

$$\text{Route 1: } 0.75 + (0.75 * 0.3) = 0.975$$

$$\text{Route 2: } 0.67 + (1 * 0.6) = 1.27$$

If we consider all 3 routes, the 3rd route is the best with 0.93hrs.

Part 3:

(10 points) 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?

- time =  $3\frac{1}{5} = 0.62 * 0.4 + 0.6 * 0.93 = 0.806$

$0.93 - 0.806 = 0.124$

Hence we can wait 0.124hrs for the information from the satellite

Part 4:

(5 points) Now put this problem into ChatGPT. Is it able to solve it correctly? If not, where does it make mistakes?

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- Question 1:

ChatGPT produced the wrong answer. ChatGPT wrote down the calculations correctly but had trouble correctly performing addition, multiplication and division operations.

- Question 2:

ChatGPT's solution differs from the solution I provided. ChatGPT found that Route 3 was the best choice with the additional information.

- Question 3:

ChatGPT gave me the correct solution.

Part 5:

Question 1: What are the three dimensions along which Big Tech has an advantage in AI?

- Big Tech excels in AI due to its extensive datasets, robust infrastructure, and top AI talent.

Question 2: Why does AI Now think it's important to focus on Big Tech?

- AI Now highlights Big Tech because it wields immense influence and sets tech norms, impacting various sectors. Addressing challenges from Big Tech can tackle invasive surveillance, economic consolidation, and inequality.

Question 3: Priority 1 discusses Algorithmic Accountability. What does this mean? Why is it important to shift responsibility for detecting harm on companies themselves?

- This term means holding tech companies accountable for their algorithms to ensure fairness, transparency, and harm prevention. Shifting responsibility onto companies aims to stop harm proactively.

Question 4: What are the windows for action that are identified? Which do you personally think are the most effective or promising?

- Strategies include controlling data, enforcing competition reforms, regulating AI models, shifting from audits, and more, depending on specific contexts and goals.