

2024 Fall

CS386-02

prof. Christopher Brooks

## Assignment 5 - Part 4

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Q1.

- Rocky Terrain : 2km/h  $\rightarrow$  30mins/km
- Sandy Terrain : 3km/h  $\rightarrow$  20mins/km
- Smooth Terrain : 5km/h  $\rightarrow$  12mins/km

**Rate 1**

$$\text{(Sandy)} \quad 0.2 * 20 (\text{mins/km}) * 5 (\text{km}) = 20 \text{ mins}$$

$$\text{(Smooth)} \quad 0.3 * 12 (\text{mins/km}) * 5 (\text{km}) = 18 \text{ mins}$$

$$\text{(Rocky)} \quad 0.5 * 30 (\text{mins/km}) * 5 (\text{km}) = 70 \text{ mins}$$

$$+ \underline{\hspace{10cm}} 113 \text{ mins}$$

## Route 2

$$(\text{Sandy}) \quad 0.4 * 20(\text{mins/km}) * 7(\text{km}) = 56 \text{ mins}$$

$$(\text{Smooth}) \quad 0.2 * 12(\text{mins/km}) * 7(\text{km}) = 16.8 \text{ mins}$$

$$(\text{Rocky}) \quad 0.4 * 30(\text{mins/km}) * 7(\text{km}) = 84 \text{ mins}$$

$$+ \text{-----} \\ 156.8 \text{ mins}$$

## Route 3

$$(\text{Sandy}) \quad 0.5 * 20(\text{mins/km}) * 6(\text{km}) = 60 \text{ mins}$$

$$(\text{Smooth}) \quad 0.4 * 12(\text{mins/km}) * 6(\text{km}) = 28.8 \text{ mins}$$

$$(\text{Rocky}) \quad 0.1 * 30(\text{mins/km}) * 6(\text{km}) = 18 \text{ mins}$$

$$+ \text{-----} \\ 106.8 \text{ mins}$$

$\therefore$  Route 3

Q2.

## Route 1

$$\text{Intacted wall} \rightarrow (113 - 20) * 0.7 = 65.1 \text{ mins}$$

$$\text{damaged wall} \rightarrow (113 + 15) * 0.3 = 38.4 \text{ mins}$$

$$+ \text{-----}$$
$$103.5 \text{ mins}$$

### Route 3

$$\text{Intacted wall} \rightarrow (106.8 + 0) * 0.4 = 42.72 \text{ mins}$$

$$\text{damaged wall} \rightarrow (106.8 + 40) * 0.6 = 88.08 \text{ mins}$$

$$+ \text{-----}$$
$$130.8 \text{ mins}$$

$\therefore$  Route 1

Q3. (First)

$$P(\text{sandy}) = 40\% / (1 - 0.4) = 2/3$$

$$P(\text{smooth}) = 20\% / (1 - 0.4) = 1/3$$

$$\therefore 20 * 2/3 + 12 * 1/3 = \underline{\underline{121.34 \text{ mins}}}$$

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Q4. (second)

$$\begin{aligned} P(\text{Not Rocky}) &= P(\text{sandy}) + P(\text{smooth}) \\ &= 0.4 + 0.2 = \underline{\underline{0.6}} \end{aligned}$$

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Q5. (third)

$$30 \text{ (mins/km)} * 7 \text{ (km)} = \underline{\underline{210 \text{ mins}}}$$

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Q6. (last)

Even if Route 2 isn't rocky, its time 121.34 mins is longer than Route 1 (103.5 mins).

∴ Therefore, there is no need to wait for the satellite.

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