

Session 6: Greedy and 2 pointers.

Greedy %

You are intelligent
an thief. 5 kg of items.
pancakes \rightarrow 20kg $\rightarrow \$5$
beef \rightarrow 5kg $\rightarrow \$7.5$
pork \rightarrow 10kg $\rightarrow \$1$
 $\Rightarrow 5 \times 7.5 + 2 \times 5$
 $\Rightarrow 35.25 + 10 = 45.25$

onion

$\rightarrow 1kg$

$\rightarrow \$8$

$\{ \{20, 120\}, \{5, 35\}, \{5, 47\}, \{25, 550\} \}$

\Rightarrow finding cost/kg

Greedy

Knapsack

HW-1

$$\begin{cases} 7kg = S \\ 40kg \end{cases}$$

pumpkin $\rightarrow \$10$, 2 kg / 5 kg/kg } 6 kg
 pineapple $\rightarrow \$15$, 3 kg $\rightarrow 5 \text{ kg}$

apple $\rightarrow \$1.5$, 1 kg
 orange $\rightarrow \$5$, 3 kg
 juice $\rightarrow \$3$, 2 kg

$\$30$
 $\$30$
 $s = 10 \text{ kg}$

6 kg
 4 kg

⑨

0/1 knapsack

$\rightarrow [1 - 5]$
 $\rightarrow 2 - 9$
 $\rightarrow [5 - 7]$

$\rightarrow (-9)$
 $3 - 9$
 $2 - 5$
 $2 - 6$
 $3 - 5$
 $4 - 7$
 $5 - 8$
 $6 - 9$

Task scheduling

8 different segments
 2^8 different ways.

⑩ Take the event that has the smaller + duration

$[1 - 5] [6 - 10]$

$\frac{5, 6}{1}$

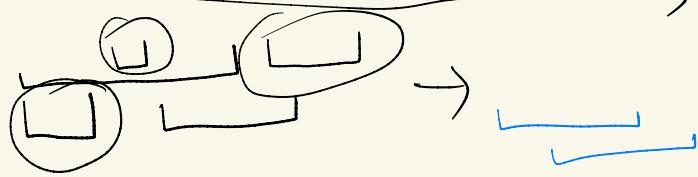
propositions \rightarrow statements that are either true or false.

Today is Sunday \rightarrow true.

Sun is smaller than the earth
 \rightarrow False.

God exists \rightarrow ~~X~~ proposition.

take the smallest duration \rightarrow True.
False.



Step 1: Find the greedy solution

Step 2: \rightarrow prove it \rightarrow solution

\rightarrow disprove it \rightarrow Go back to Step 1.

Another idea: 7am, 5am X

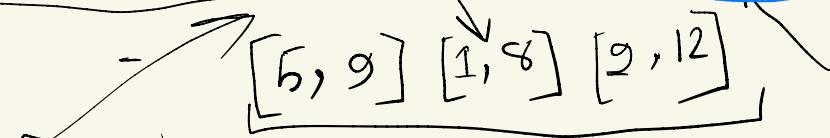
5am, 6am

\rightarrow $([7, 9], [5, 10])$
 $[9, \dots]$

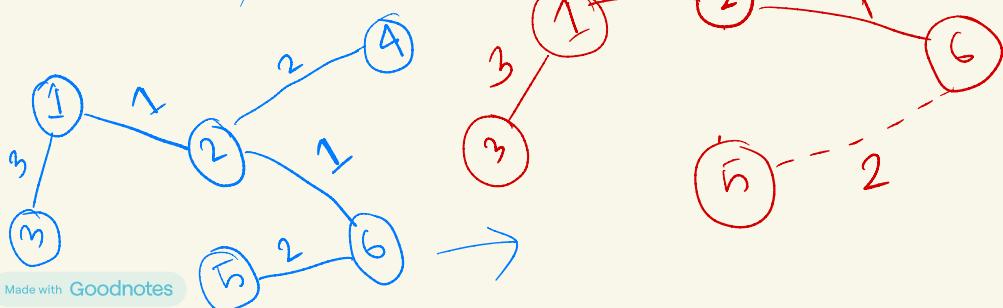
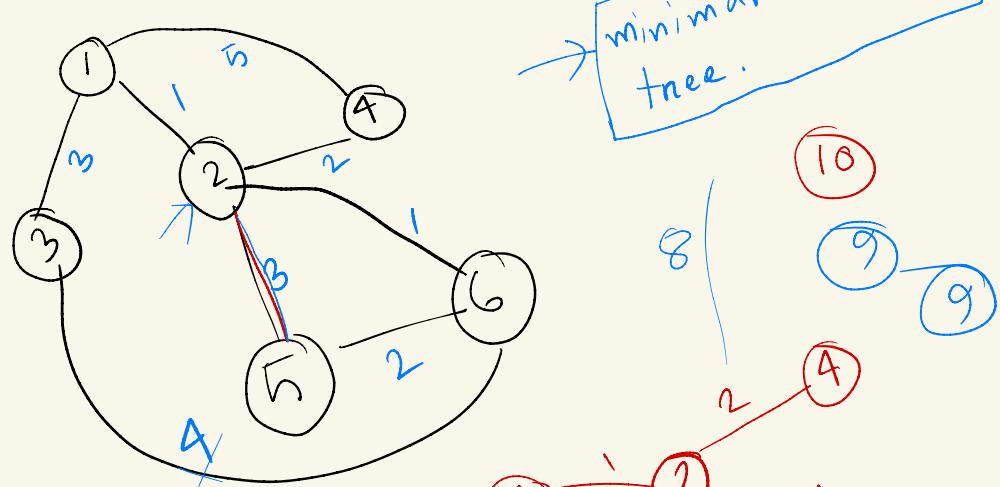
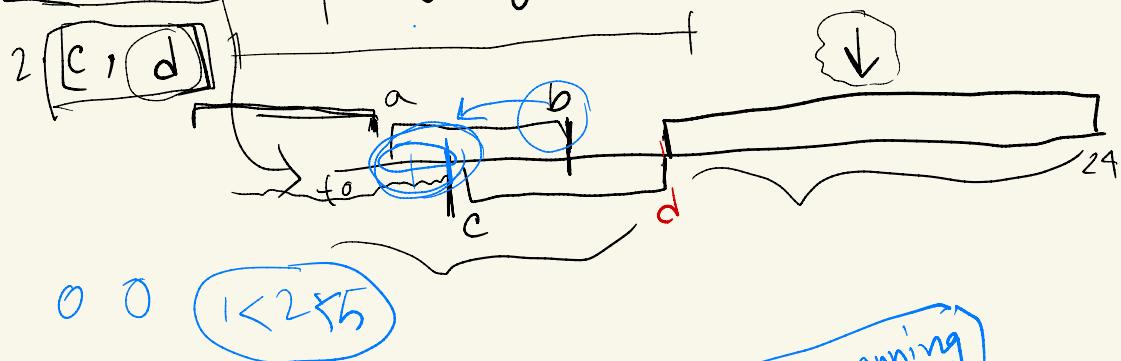
$5 - 12$

$6, 7, 8, \dots$

Third idea: take event that ends early.



$b < d$
proof by contradiction.



idea: [Sorting the edges based on their weight
and taking them if the nodes aren't
connected yet.
→ Prove on disprove.