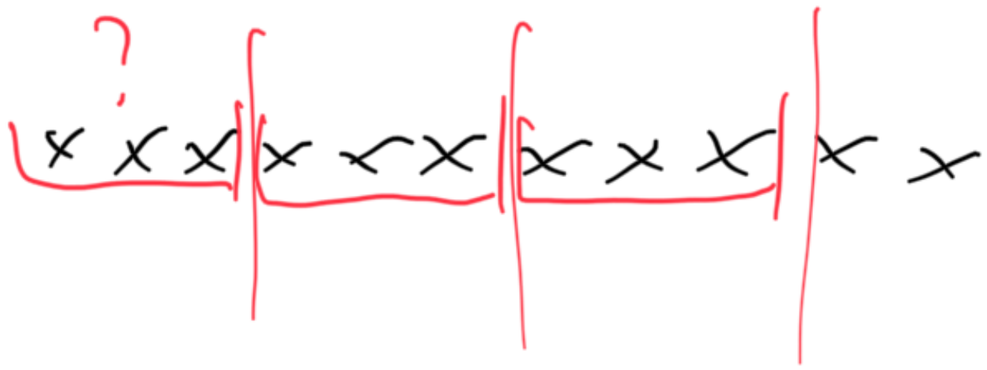
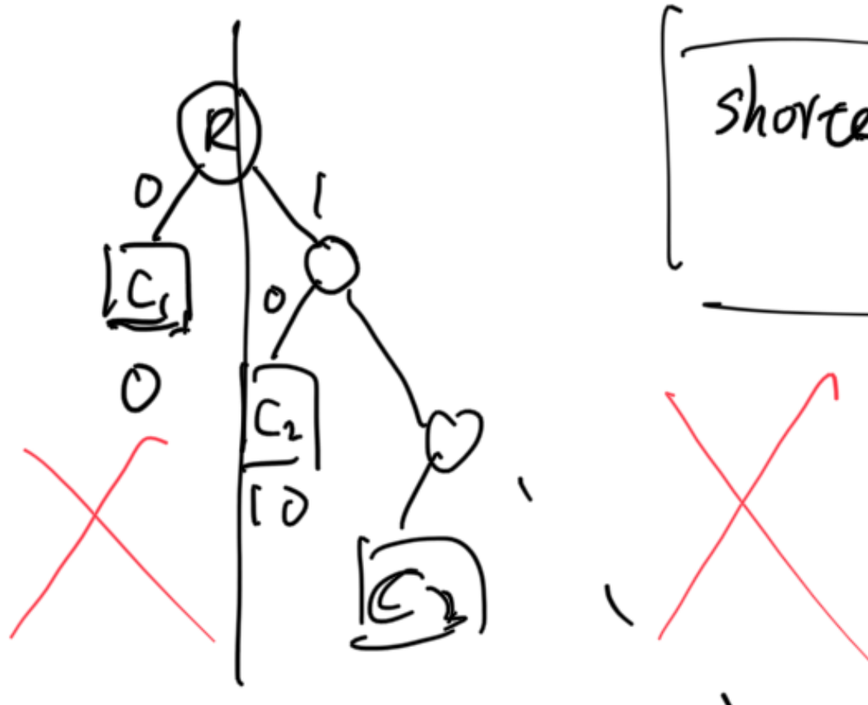
Lecture 11, Fall 2023



sort all characters by freq.

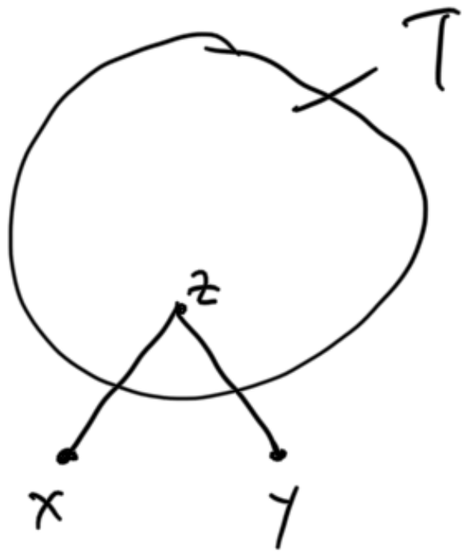
$C_1\ C_2\ \cdots\ C_n$



shortest code to most freq. symbols

longest code to least freq. symbols

Try. Symbols



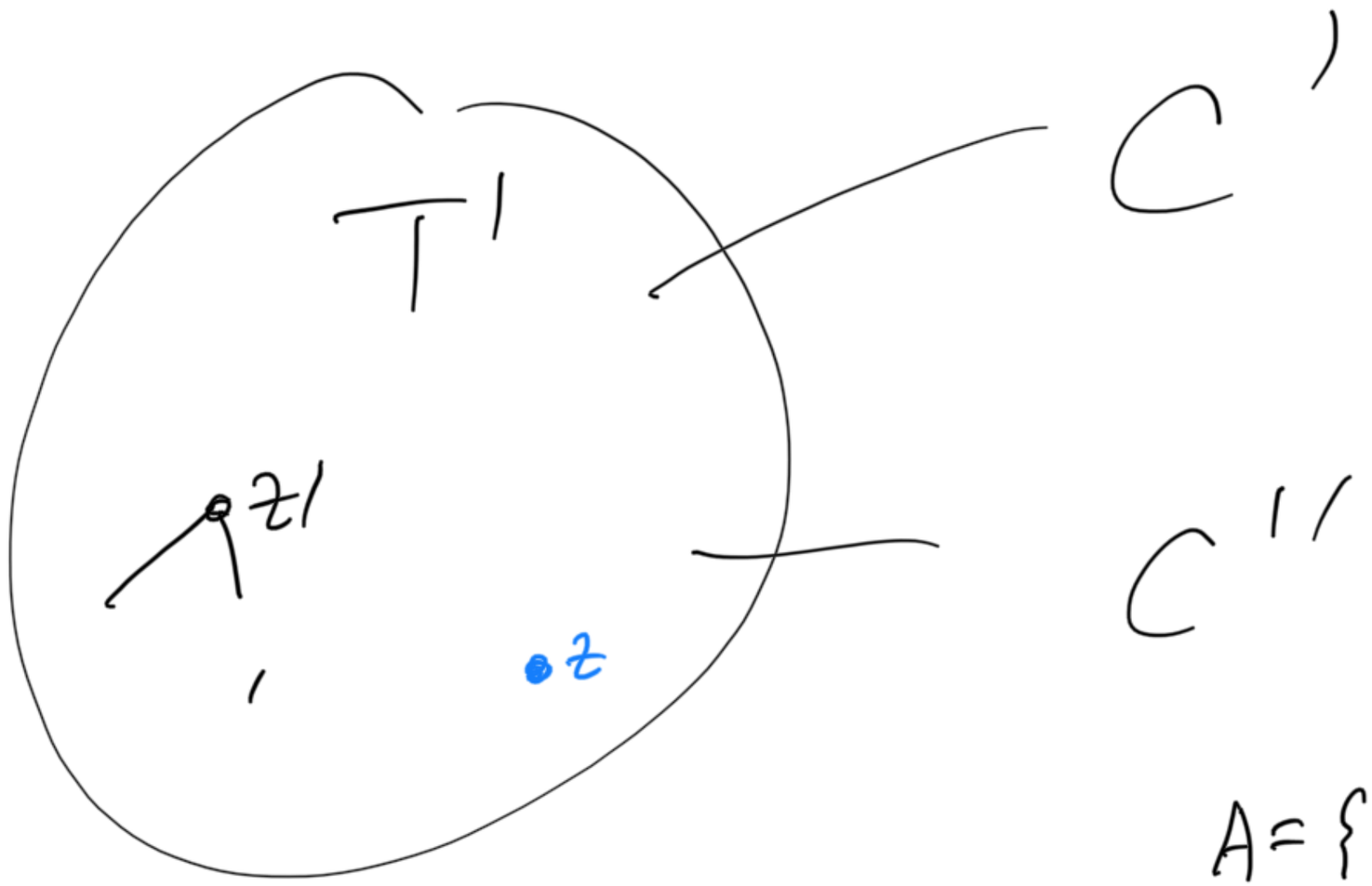
$$B(T) = \sum_{c \in C} c.\text{freq}\, d_T(c) = \sum_{c \neq x,y} c.\text{freq}\, d_T(c) + x.\text{freq}\, d_T(x) + y.\text{freq}\, d_T(y)$$

$$B(T') = \sum_{c \in C'} c.\text{freq}\, d_{T'}(c) = \sum_{c \neq x,y} c.\text{freq}\, d_T(c) + z.\text{freq}\, d_{T'}(z)$$

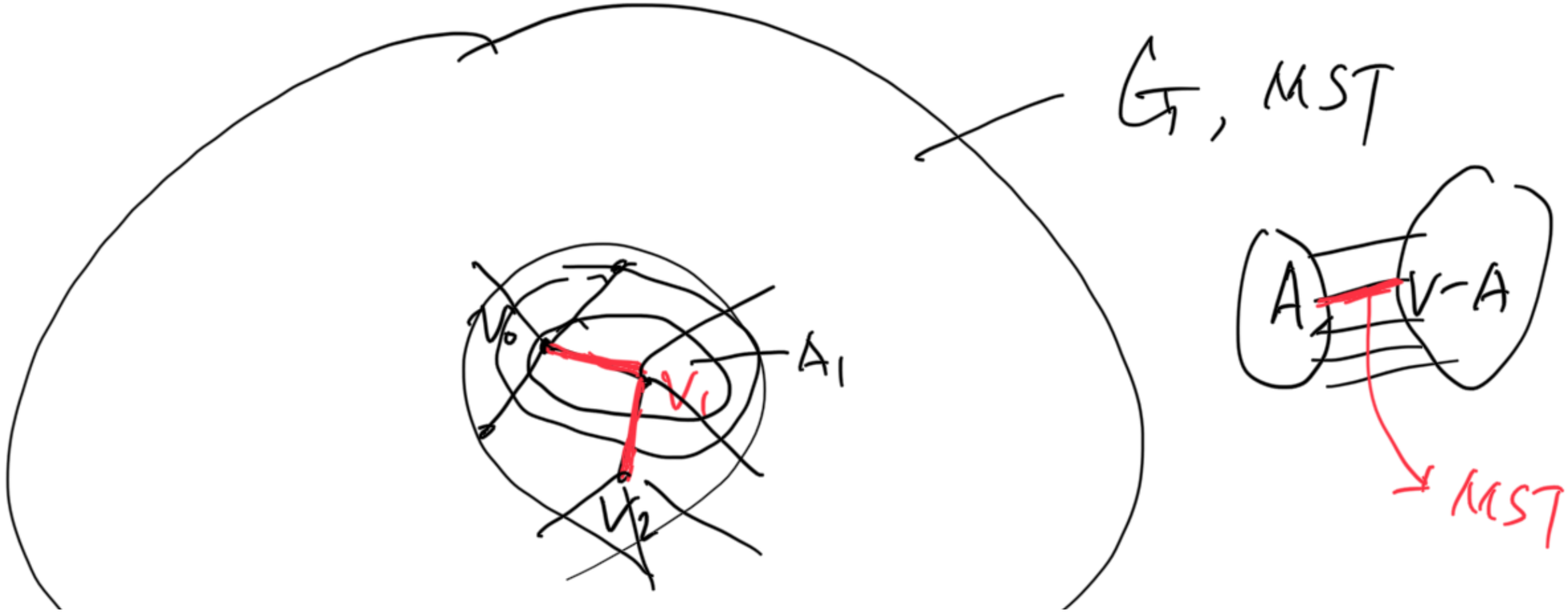
$$d_{T'}(z) = d_T(x) - 1 = d_T(y) - 1$$

$$z.\text{freq} = x.\text{freq} + y.\text{freq}$$

$$B(T') = B(T) - x.\text{freq} - y.\text{freq}$$



$A = \{v_0\}$



$A_0 = \{V_0\}$ $V - A_0 =$

$T_1 = \{(V_0, V_1)\}$

$A_1 = \{V_0, V_1\}$

$T_2 = \{(V_0, V_1), (V_1, V_2\}$

$A_2 = \{V_0, V_1, V_3)$

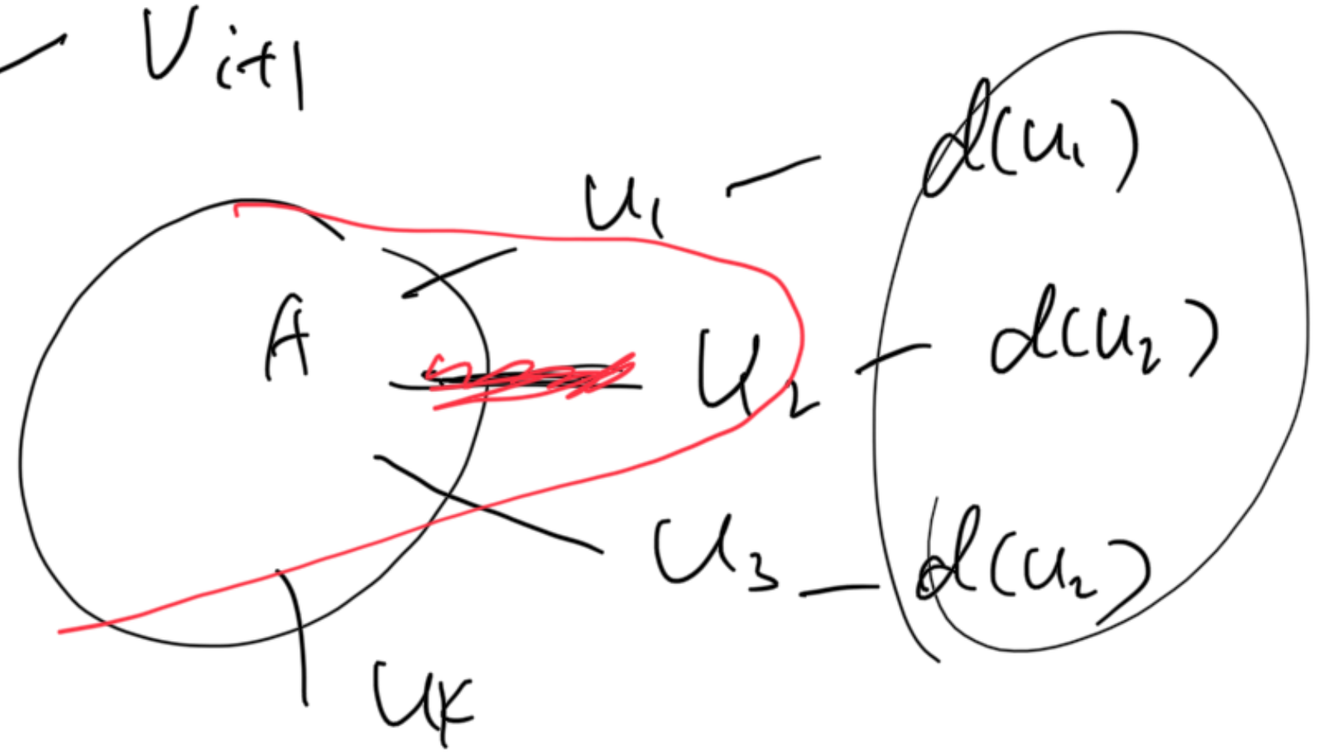
$A_i = \{V_0, V_1, \cdots V_i\}$

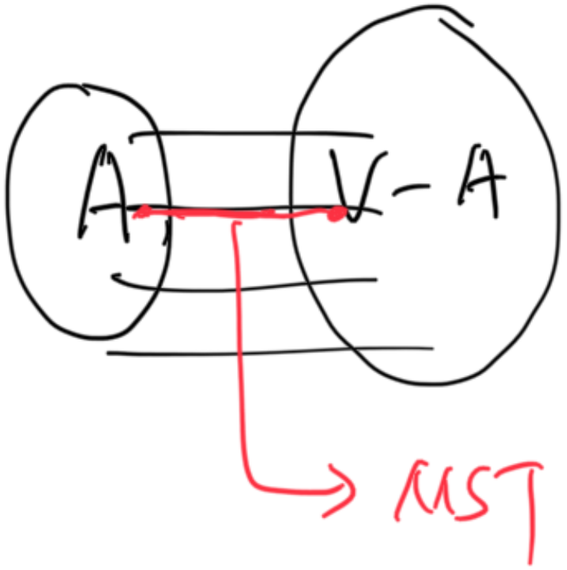
Least weigh edge connecting A_i to $V - A_i$

$d(u)$: the least weight edge connecting u to

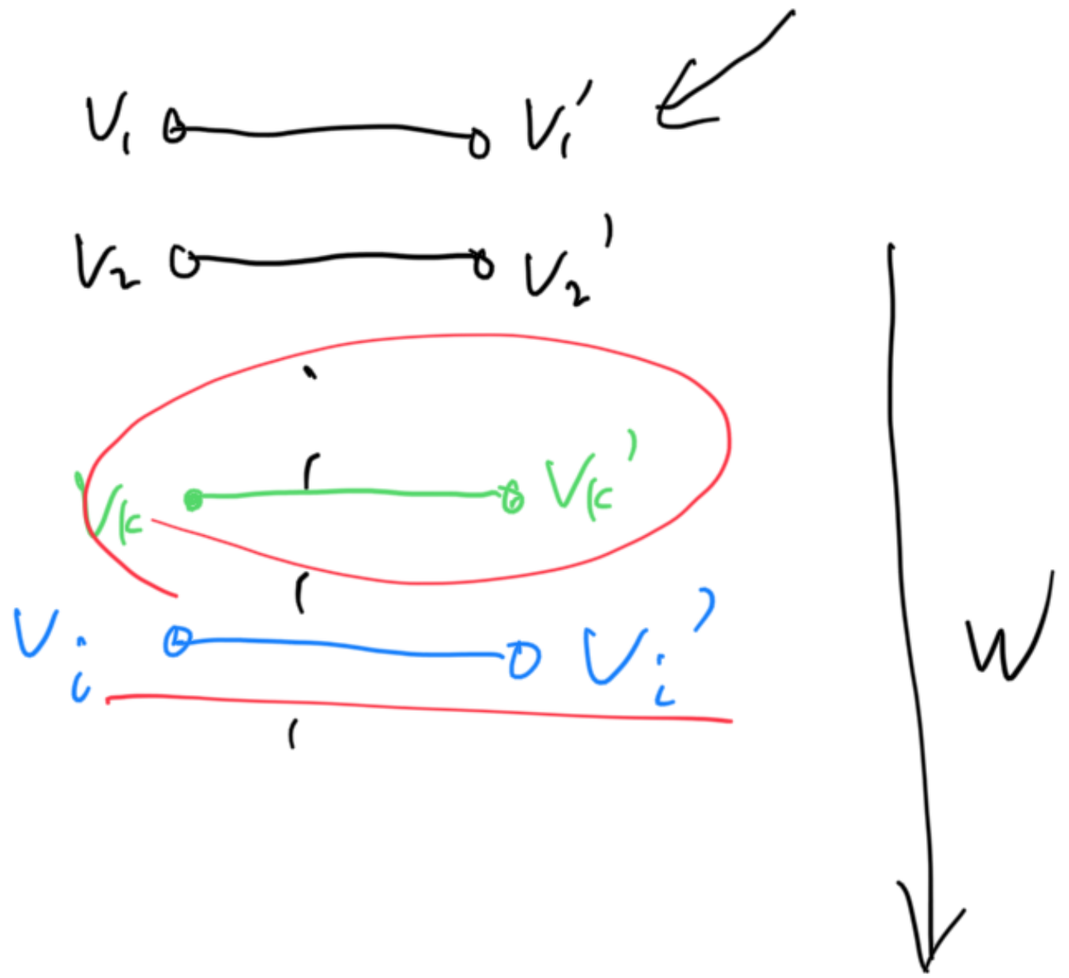
Some node in A

$A_i \leftarrow V_{i+1}$





(1) (2) - - (n)



v_1, v_1'

$T = \{(v_1, v_1')\}$ ✓

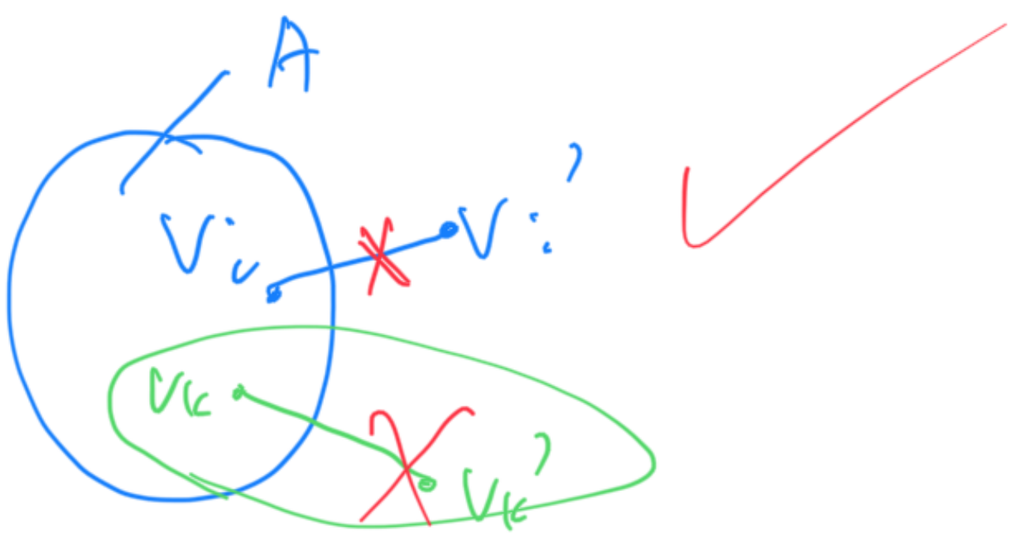
$A = \{v_1, v_1'\}$

V_i and V_i' not in the same set

$(v_i, v_i') \not\Rightarrow T$

V_i in set A

V_i' must be in set $V-A$



✓