一. (1): $V_{n+1}=0$, $V_n=\alpha_n u_n$

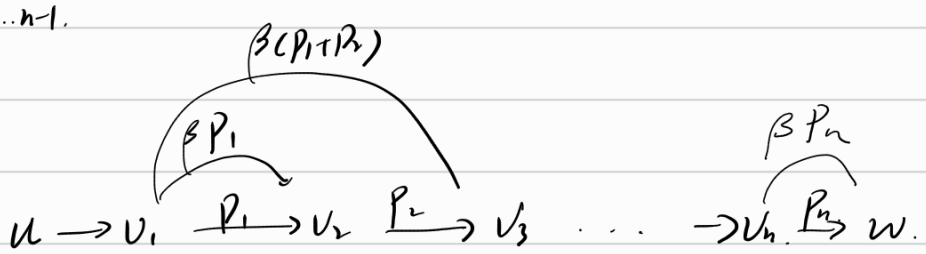
$V_k=\max\{\alpha_{k+1}u_{k+1},\ \alpha_{k+1}V_{k+1},\ (1-\alpha_{k+1})V_{k+1}\}$ $k=1,2,\cdots,n-1$,

(2): $\max \sum_{i=1}^{n} x_i$

$s.t.\ x_i\le\alpha_{i+1}u_{i+1},\ i=1,2,\cdots,n-1.$

$x_n=\alpha_n u_n.$

二、



在 $e_{u,v_1}=0$, $e_{v_n,w}=0$. $e_{v_i,v_{i+1}}=P_i$, $i=1,2,\cdots,n-1$. $e_{v_n,w}=P_n$

且 $\forall i\in\{1,2,\cdots,n-1\}$, 若 $l_i\in\{i+1,i+2,\cdots,n\}$, s.t. $t_{l_i}-t_i>T$ 且 $t_{l_i-1}-t_i\le T$. 则置

$$e_{v_i,v_{l_i}}=c+\beta\sum_{j=i}^{l_i-1}P_j.$$

若不存在上述 l_i. 则置 $e_{v_i,w}=c+\beta\sum_{j=i}^{n}P_j$.

则问题等价于找到由 u 到 w 的一条最短路.