

1 Problem statement

1.1 Version 1

Input:

- Set $\mathcal{R} = (R_1, R_2, \dots, R_m)$ representing available resources, where each resource $R_k \in \mathcal{R}$ has capacity c_k .
- Value g , representing GPU capacity.
- Set $\mathcal{T} = (T_1, T_2, \dots, T_n)$ representing tasks to be scheduled. Each task $T_i \in \mathcal{T}$ is characterized by processing time p_i , resource assignment function $a_r : \mathcal{T} \rightarrow \mathcal{R}$ and GPU offloading function $a_g : \mathcal{T} \rightarrow \{0, 1\}$.
- Value h , representing main frame length.

Objective: Let $\mathcal{W} = (W_1, W_2, \dots, W_\ell)$ be a set of isolation windows, where each window $W_j \in \mathcal{W}$ has length l_j . The goal is to assign each task $T_i \in \mathcal{T}$ to a window $W_j \in \mathcal{W}$ such that:

$$l_j \geq \frac{\max_{T_i \in W_j} (p_i)}{0.6}, \forall W_j \in \mathcal{W} \quad (1)$$

$$\sum_{W_j \in \mathcal{W}} l_j \leq h \quad (2)$$

$$\sum_{T_i \in W_j} \mathbb{1}_{[a_r(T_i) == R_k]} \leq c_k, \forall R_k \in \mathcal{R}, \forall W_j \in \mathcal{W} \quad (3)$$

$$\sum_{T_i \in W_j} a_g(T_i) \leq g, \forall W_j \in \mathcal{W} \quad (4)$$