1 CP Model: Cumulative Sums

This encoding uses the idea behind sequence constraint in [**?**] and we adapt it here for the AtMostSeqCard with redundant constraints. Let S_i be an integer variable encoding the partial sum of positions $1 \dots n$. Then we post the following linear constraints and enforce bounds consistency on all. For all positions i and demands d, and the mapping between cars k and options l:

$$S_{i-1} \leq S_i \tag{1}$$

$$S_i \leq S_{i-1} + 1 \tag{2}$$

$$S_i = S_{i-1} + x_i \tag{3}$$

$$S_i \leq S_{i-q} + u \tag{4}$$

$$S_n = d \tag{5}$$

$$S_i^l = \sum_{k \in m'(l)} S_i^k \tag{6}$$

$$i = \sum_{k \in C} S_i^k \tag{7}$$