Uebersicht Algos

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OneStepCD

Algorithm 1: OneStepCD

Input: An uncolored Graph $G = (V, E)$
Output: A feasible Coloring V'

Remove from G all edges $(i, j) \in E : i, j \in V^k$ for some $k = 1, \ldots, q$;
Set $V' \leftarrow \emptyset$;
while $|V'| < q$ **do**
    Set $X \leftarrow \emptyset$;
    for $k = 1, \ldots, q : V_k \cap V' = 0$ **do**
        Set $X \leftarrow X \cup argmin\{CD(i) : i \in V^k\}$;
    Set $x \leftarrow argmax\{CD(i) : i \in X\}$;
    Set $V' \leftarrow V' \cup \{x\}$;
    Assign the minimum possible colour to x;
    Remove from G all nodes in $V_{c(x)} \setminus \{x\}$;
return V';

OneStepCD Recoloring:

Gesamtalgorithmus:

Algorithm 2: OneStepCD Recoloring

Input: An partial Solution P, a number of maximum colours $cmax$
Output: A feasible Coloring S

Let U be the set of uncolored nodes in P;
while $|U| > 0$ **do**
    Set $X \leftarrow \emptyset$;
    for $k = 1, \ldots, q$: $V_k \cap V' = 0$ **do**
        Set $X \leftarrow X \cup argmin\{CD(i) : i \in V^k\}$;
    Set $x \leftarrow argmax\{CD(i) : i \in X\}$;
    Set $V' \leftarrow V' \cup \{x\}$;
    Set $cmin \leftarrow$ the minimum possible colour ;
    if $cmin \geq cmax$ **then**
        $cmin \leftarrow$ the color that produces the fewest conflicts.
    Assign $cmin$ to x;
    Remove from G all nodes in $V_{c(x)} \setminus \{x\}$;
return V';

Algorithm 3: PCP HYBRID

Input: An uncolored Graph $G = (V, E)$, a recoloring-algorithm $RECOLOR$

Output: A feasible Coloring S

1 Set $S \leftarrow OneStepCD(G)$;
2 Set $cmax \leftarrow$ the chromatic number of S;
3 Set $X \leftarrow \emptyset$;
4 **for** $c = 1, \ldots, cmax$ **do**
5 Let V_c be the set of nodes coloured by the colour c;
6 Uncolor all nodes in V_c;
7 $S_c \leftarrow RECOLOR(V_c, cmax - 1)$;
8 Let C be the Set of nodes involved in color conflicts of S_c;
9 Set $C_c \leftarrow C \setminus V_c$;
10 $X \leftarrow X \cup (S_c, V_c, C_c)$
11 Sort X ascendingly by $|C_c|$;
12 Set $reduction \leftarrow$ false;
13 **for** $(S_c, V_c, C_c) \in X$ **do**
14 $S_c \leftarrow TabuSearch(S_c, V_c, C_c)$;
15 **if** S_c *if free of conflicts* **then**
16 $reduction \leftarrow$ true;
17 break;
18 **if** $reduction$ **then**
19 $S \leftarrow S_c$;
20 $cmax = cmax - 1$;
21 **goto** line 3;
22 **return** S;