CASHWMaxSAT-CorePlus: Solver Description

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Abstract—This document describes the MaxSAT solver CASHWMaxSAT-CorePlus, submitted to the complete tracks (include unweighted and weighted track) of MaxSAT Evaluation 2023.

I. INTRODUCTION

We developed an improved complete MaxSAT solver called CASHWMaxSAT-CorePlus based on UWrMaxSat [1], SCIP 8.0 [2] and CASHWMaxSAT [3]. In addition, CASHWMaxSAT-CorePlus used an unsatisfiable-core-based OLL procedure [4]–[7]. In this work, we propose two novel ideas to improve the last year's version of CASHWMaxSAT-CorePlus [8].

- For weighted instances, previous works usually divided the soft clauses into different layers based on clauses' weight value. The soft clauses with the same weight value are in the same layer. Different from previous method, we adopt a new layered approach. Assume that the maximum weight value of soft clauses is w_{max}. we will put all the soft clauses whose weight value is in $[w_{max}/2n, w_{max}/n]$ into the same layer where an integer $n \geq 1$.

- For unweighted instances, we call the SAT solver to solve the given instances that only includes all hard clauses. If the SAT solver returns the "sat" state, we will obtain an assignment. We put all true soft clauses based on the assignment into the SAT solver and call the SAT solver. After many iterations, the SAT solver will return the "sat" state. After then, we will put the remaining soft clauses into the SAT solvers and solve them.

II. FUTURE WORK

First, we could use a simplified version of MaxSAT local search solvers to improve the satisfied solution. Second, we could try to design a novel selection way for selecting an unsatisfiable-core on weighted cases.

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