

Inference for SRL

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Chapter 1

Probabilistic Inference Using Weighted Model Counting

1.1

1.1.1 ENC 1

Indicator clauses:

$$\begin{aligned} & (\neg\lambda_{PollutionLow} \vee \neg\lambda_{PollutionHigh}) \wedge (\lambda_{PollutionLow} \vee \lambda_{PollutionHigh}) \wedge \\ & (\neg\lambda_{SmokerTrue} \vee \neg\lambda_{SmokerFalse}) \wedge (\lambda_{SmokerTrue} \vee \lambda_{SmokerFalse}) \wedge \\ & (\neg\lambda_{CancerTrue} \vee \neg\lambda_{CancerFalse}) \wedge (\lambda_{CancerTrue} \vee \lambda_{CancerFalse}) \wedge \\ & (\neg\lambda_{XrayPositive} \vee \neg\lambda_{XrayNegative}) \wedge (\lambda_{XrayPositive} \vee \lambda_{XrayNegative}) \wedge \\ & (\neg\lambda_{DyspnoeaTrue} \vee \neg\lambda_{DyspnoeaFalse}) \wedge (\lambda_{DyspnoeaTrue} \vee \lambda_{DyspnoeaFalse}) \end{aligned}$$

Parameter clauses:

$$\begin{aligned} & (\neg\lambda_{PollutionLow} \vee \theta_{PollutionLow}) \wedge (\lambda_{PollutionLow} \vee \neg\theta_{PollutionLow}) \wedge \\ & (\neg\lambda_{PollutionHigh} \vee \theta_{PollutionHigh}) \wedge (\lambda_{PollutionHigh} \vee \neg\theta_{PollutionHigh}) \wedge \\ & (\neg\lambda_{SmokerTrue} \vee \theta_{SmokerTrue}) \wedge (\lambda_{SmokerTrue} \vee \neg\theta_{SmokerTrue}) \wedge (\neg\lambda_{SmokerFalse} \vee \\ & \quad \theta_{SmokerFalse}) \wedge (\lambda_{SmokerFalse} \vee \neg\theta_{SmokerFalse}) \wedge (\neg\lambda_{PollutionLow} \vee \\ & \quad \neg\lambda_{SmokerTrue} \vee \neg\lambda_{CancerTrue} \vee \theta_{CancerTrue|PollutionLow,SmokerTrue}) \wedge \\ & (\lambda_{PollutionLow} \vee \neg\theta_{CancerTrue|PollutionLow,SmokerTrue}) \wedge (\lambda_{SmokerTrue} \vee \\ & \quad \neg\theta_{CancerTrue|PollutionLow,SmokerTrue}) \wedge (\lambda_{CancerTrue} \vee \\ & \quad \neg\theta_{CancerTrue|PollutionLow,SmokerTrue}) \wedge (\neg\lambda_{PollutionLow} \vee \neg\lambda_{SmokerTrue} \vee \\ & \quad \neg\lambda_{CancerFalse} \vee \theta_{CancerFalse|PollutionLow,SmokerTrue}) \wedge (\lambda_{PollutionLow} \vee \\ & \quad \neg\theta_{CancerFalse|PollutionLow,SmokerTrue}) \wedge (\lambda_{SmokerTrue} \vee \end{aligned}$$

$$\begin{aligned}
& \neg\theta_{CancerFalse|PollutionLow,SmokerTrue}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{CancerFalse|PollutionLow,SmokerTrue}) \wedge (\neg\lambda_{PollutionLow} \vee \neg\lambda_{SmokerFalse} \vee \\
& \neg\lambda_{CancerTrue} \vee \theta_{CancerTrue|PollutionLow,SmokerFalse}) \wedge (\lambda_{PollutionLow} \vee \\
& \neg\theta_{CancerTrue|PollutionLow,SmokerFalse}) \wedge (\lambda_{SmokerFalse} \vee \\
& \neg\theta_{CancerTrue|PollutionLow,SmokerFalse}) \wedge (\lambda_{CancerTrue} \vee \\
& \neg\theta_{CancerTrue|PollutionLow,SmokerFalse}) \wedge (\neg\lambda_{PollutionLow} \vee \neg\lambda_{SmokerFalse} \vee \\
& \neg\lambda_{CancerFalse} \vee \theta_{CancerFalse|PollutionLow,SmokerFalse}) \wedge (\lambda_{PollutionLow} \vee \\
& \neg\theta_{CancerFalse|PollutionLow,SmokerFalse}) \wedge (\lambda_{SmokerFalse} \vee \\
& \neg\theta_{CancerFalse|PollutionLow,SmokerFalse}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{CancerFalse|PollutionLow,SmokerFalse}) \wedge (\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerTrue} \vee \\
& \neg\lambda_{CancerTrue} \vee \theta_{CancerTrue|PollutionHigh,SmokerTrue}) \wedge (\lambda_{PollutionHigh} \vee \\
& \neg\theta_{CancerTrue|PollutionHigh,SmokerTrue}) \wedge (\lambda_{SmokerTrue} \vee \\
& \neg\theta_{CancerTrue|PollutionHigh,SmokerTrue}) \wedge (\lambda_{CancerTrue} \vee \\
& \neg\theta_{CancerTrue|PollutionHigh,SmokerTrue}) \wedge (\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerTrue} \vee \\
& \neg\lambda_{CancerFalse} \vee \theta_{CancerFalse|PollutionHigh,SmokerTrue}) \wedge (\lambda_{PollutionHigh} \vee \\
& \neg\theta_{CancerFalse|PollutionHigh,SmokerTrue}) \wedge (\lambda_{SmokerTrue} \vee \\
& \neg\theta_{CancerFalse|PollutionHigh,SmokerTrue}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{CancerFalse|PollutionHigh,SmokerTrue}) \wedge (\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerFalse} \vee \\
& \neg\lambda_{CancerTrue} \vee \theta_{CancerTrue|PollutionHigh,SmokerFalse}) \wedge (\lambda_{PollutionHigh} \vee \\
& \neg\theta_{CancerTrue|PollutionHigh,SmokerFalse}) \wedge (\lambda_{SmokerFalse} \vee \\
& \neg\theta_{CancerTrue|PollutionHigh,SmokerFalse}) \wedge (\lambda_{CancerTrue} \vee \\
& \neg\theta_{CancerTrue|PollutionHigh,SmokerFalse}) \wedge (\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerFalse} \vee \\
& \neg\lambda_{CancerFalse} \vee \theta_{CancerFalse|PollutionHigh,SmokerFalse}) \wedge (\lambda_{PollutionHigh} \vee \\
& \neg\theta_{CancerFalse|PollutionHigh,SmokerFalse}) \wedge (\lambda_{SmokerFalse} \vee \\
& \neg\theta_{CancerFalse|PollutionHigh,SmokerFalse}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{CancerFalse|PollutionHigh,SmokerFalse}) \wedge (\neg\lambda_{CancerTrue} \vee \neg\lambda_{XrayPositive} \vee \\
& \theta_{XrayPositive|CancerTrue}) \wedge (\lambda_{CancerTrue} \vee \neg\theta_{XrayPositive|CancerTrue}) \wedge \\
& (\lambda_{XrayPositive} \vee \neg\theta_{XrayPositive|CancerTrue}) \wedge (\neg\lambda_{CancerTrue} \vee \neg\lambda_{XrayNegative} \vee \\
& \theta_{XrayNegative|CancerTrue}) \wedge (\lambda_{CancerTrue} \vee \neg\theta_{XrayNegative|CancerTrue}) \wedge \\
& (\lambda_{XrayNegative} \vee \neg\theta_{XrayNegative|CancerTrue}) \wedge (\neg\lambda_{CancerFalse} \vee \\
& \neg\lambda_{XrayPositive} \vee \theta_{XrayPositive|CancerFalse}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{XrayPositive|CancerFalse}) \wedge (\lambda_{XrayPositive} \vee \neg\theta_{XrayPositive|CancerFalse}) \wedge \\
& (\neg\lambda_{CancerFalse} \vee \neg\lambda_{XrayNegative} \vee \theta_{XrayNegative|CancerFalse}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{XrayNegative|CancerFalse}) \wedge (\lambda_{XrayNegative} \vee \neg\theta_{XrayNegative|CancerFalse}) \wedge \\
& (\neg\lambda_{CancerTrue} \vee \neg\lambda_{DyspnoeaTrue} \vee \theta_{DyspnoeaTrue|CancerTrue}) \wedge (\lambda_{CancerTrue} \vee \\
& \neg\theta_{DyspnoeaTrue|CancerTrue}) \wedge (\lambda_{DyspnoeaTrue} \vee \neg\theta_{DyspnoeaTrue|CancerTrue}) \wedge \\
& (\neg\lambda_{CancerTrue} \vee \neg\lambda_{DyspnoeaFalse} \vee \theta_{DyspnoeaFalse|CancerTrue}) \wedge (\lambda_{CancerTrue} \vee \\
& \neg\theta_{DyspnoeaFalse|CancerTrue}) \wedge (\lambda_{DyspnoeaFalse} \vee \neg\theta_{DyspnoeaFalse|CancerTrue}) \wedge \\
& (\neg\lambda_{CancerFalse} \vee \neg\lambda_{DyspnoeaTrue} \vee \theta_{DyspnoeaTrue|CancerFalse}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{DyspnoeaTrue|CancerFalse}) \wedge (\lambda_{DyspnoeaTrue} \vee \neg\theta_{DyspnoeaTrue|CancerFalse}) \wedge \\
& (\neg\lambda_{CancerFalse} \vee \neg\lambda_{DyspnoeaFalse} \vee \theta_{DyspnoeaFalse|CancerFalse}) \wedge (\lambda_{CancerFalse} \vee \\
& \neg\theta_{DyspnoeaFalse|CancerFalse}) \wedge (\lambda_{DyspnoeaFalse} \vee \neg\theta_{DyspnoeaFalse|CancerFalse})
\end{aligned}$$

Weights

$$\begin{aligned}
W(\lambda_{PollutionLow}) &= 1.00 \\
W(\neg\lambda_{PollutionLow}) &= 1.00 \\
W(\lambda_{PollutionHigh}) &= 1.00 \\
W(\neg\lambda_{PollutionHigh}) &= 1.00 \\
W(\lambda_{SmokerTrue}) &= 1.00
\end{aligned}$$

$W(\neg\lambda_{SmokerTrue}) = 1.00$
 $W(\lambda_{SmokerFalse}) = 1.00$
 $W(\neg\lambda_{SmokerFalse}) = 1.00$
 $W(\lambda_{CancerTrue}) = 1.00$
 $W(\neg\lambda_{CancerTrue}) = 1.00$
 $W(\lambda_{CancerFalse}) = 1.00$
 $W(\neg\lambda_{CancerFalse}) = 1.00$
 $W(\lambda_{XrayPositive}) = 1.00$
 $W(\neg\lambda_{XrayPositive}) = 1.00$
 $W(\lambda_{XrayNegative}) = 1.00$
 $W(\neg\lambda_{XrayNegative}) = 1.00$
 $W(\lambda_{DyspnoeaTrue}) = 1.00$
 $W(\neg\lambda_{DyspnoeaTrue}) = 1.00$
 $W(\lambda_{DyspnoeaFalse}) = 1.00$
 $W(\neg\lambda_{DyspnoeaFalse}) = 1.00$
 $W(\theta_{PollutionLow}) = 0.90$
 $W(\neg\theta_{PollutionLow}) = 1.00$
 $W(\theta_{PollutionHigh}) = 0.10$
 $W(\neg\theta_{PollutionHigh}) = 1.00$
 $W(\theta_{SmokerTrue}) = 0.30$
 $W(\neg\theta_{SmokerTrue}) = 1.00$
 $W(\theta_{SmokerFalse}) = 0.70$
 $W(\neg\theta_{SmokerFalse}) = 1.00$
 $W(\theta_{CancerTrue|PollutionLow,SmokerTrue}) = 0.03$
 $W(\neg\theta_{CancerTrue|PollutionLow,SmokerTrue}) = 1.00$
 $W(\theta_{CancerFalse|PollutionLow,SmokerTrue}) = 0.97$
 $W(\neg\theta_{CancerFalse|PollutionLow,SmokerTrue}) = 1.00$
 $W(\theta_{CancerTrue|PollutionLow,SmokerFalse}) = 0.00$
 $W(\neg\theta_{CancerTrue|PollutionLow,SmokerFalse}) = 1.00$
 $W(\theta_{CancerFalse|PollutionLow,SmokerFalse}) = 1.00$
 $W(\neg\theta_{CancerFalse|PollutionLow,SmokerFalse}) = 1.00$
 $W(\theta_{CancerTrue|PollutionHigh,SmokerTrue}) = 0.05$
 $W(\neg\theta_{CancerTrue|PollutionHigh,SmokerTrue}) = 1.00$
 $W(\theta_{CancerFalse|PollutionHigh,SmokerTrue}) = 0.95$
 $W(\neg\theta_{CancerFalse|PollutionHigh,SmokerTrue}) = 1.00$
 $W(\theta_{CancerTrue|PollutionHigh,SmokerFalse}) = 0.02$
 $W(\neg\theta_{CancerTrue|PollutionHigh,SmokerFalse}) = 1.00$
 $W(\theta_{CancerFalse|PollutionHigh,SmokerFalse}) = 0.98$
 $W(\neg\theta_{CancerFalse|PollutionHigh,SmokerFalse}) = 1.00$
 $W(\theta_{XrayPositive|CancerTrue}) = 0.90$
 $W(\neg\theta_{XrayPositive|CancerTrue}) = 1.00$
 $W(\theta_{XrayNegative|CancerTrue}) = 0.10$
 $W(\neg\theta_{XrayNegative|CancerTrue}) = 1.00$
 $W(\theta_{XrayPositive|CancerFalse}) = 0.20$
 $W(\neg\theta_{XrayPositive|CancerFalse}) = 1.00$
 $W(\theta_{XrayNegative|CancerFalse}) = 0.80$
 $W(\neg\theta_{XrayNegative|CancerFalse}) = 1.00$
 $W(\theta_{DyspnoeaTrue|CancerTrue}) = 0.65$
 $W(\neg\theta_{DyspnoeaTrue|CancerTrue}) = 1.00$
 $W(\theta_{DyspnoeaFalse|CancerTrue}) = 0.35$

$$\begin{aligned}
W(\neg\theta_{DyspnoeaFalse|CancerTrue}) &= 1.00 \\
W(\theta_{DyspnoeaTrue|CancerFalse}) &= 0.30 \\
W(\neg\theta_{DyspnoeaTrue|CancerFalse}) &= 1.00 \\
W(\theta_{DyspnoeaFalse|CancerFalse}) &= 0.70 \\
W(\neg\theta_{DyspnoeaFalse|CancerFalse}) &= 1.00
\end{aligned}$$

1.1.2 ENC 2

Indicator clauses

$$\begin{aligned}
&(\neg\lambda_{PollutionLow} \vee \neg\lambda_{PollutionHigh}) \wedge (\lambda_{PollutionLow} \vee \lambda_{PollutionHigh}) \wedge \\
&(\neg\lambda_{SmokerTrue} \vee \neg\lambda_{SmokerFalse}) \wedge (\lambda_{SmokerTrue} \vee \lambda_{SmokerFalse}) \wedge \\
&(\neg\lambda_{CancerTrue} \vee \neg\lambda_{CancerFalse}) \wedge (\lambda_{CancerTrue} \vee \lambda_{CancerFalse}) \wedge \\
&(\neg\lambda_{XrayPositive} \vee \neg\lambda_{XrayNegative}) \wedge (\lambda_{XrayPositive} \vee \lambda_{XrayNegative}) \wedge \\
&(\neg\lambda_{DyspnoeaTrue} \vee \neg\lambda_{DyspnoeaFalse}) \wedge (\lambda_{DyspnoeaTrue} \vee \lambda_{DyspnoeaFalse})
\end{aligned}$$

Parameter clauses

$$\begin{aligned}
&(\neg\rho_{PollutionLow} \vee \lambda_{PollutionLow}) \wedge (\rho_{PollutionLow} \vee \lambda_{PollutionHigh}) \wedge \\
&(\neg\rho_{SmokerTrue} \vee \lambda_{SmokerTrue}) \wedge (\rho_{SmokerTrue} \vee \lambda_{SmokerFalse}) \wedge (\neg\lambda_{PollutionLow} \vee \\
&\neg\lambda_{SmokerTrue} \vee \neg\rho_{CancerTrue|PollutionLow,SmokerTrue} \vee \lambda_{CancerTrue}) \wedge \\
&(\neg\lambda_{PollutionLow} \vee \neg\lambda_{SmokerTrue} \vee \rho_{CancerTrue|PollutionLow,SmokerTrue} \vee \\
&\lambda_{CancerFalse}) \wedge (\neg\lambda_{PollutionLow} \vee \neg\lambda_{SmokerFalse} \vee \\
&\neg\rho_{CancerTrue|PollutionLow,SmokerFalse} \vee \lambda_{CancerTrue}) \wedge (\neg\lambda_{PollutionLow} \vee \\
&\neg\lambda_{SmokerFalse} \vee \rho_{CancerTrue|PollutionLow,SmokerFalse} \vee \lambda_{CancerFalse}) \wedge \\
&(\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerTrue} \vee \neg\rho_{CancerTrue|PollutionHigh,SmokerTrue} \vee \\
&\lambda_{CancerTrue}) \wedge (\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerTrue} \vee \\
&\rho_{CancerTrue|PollutionHigh,SmokerTrue} \vee \lambda_{CancerFalse}) \wedge (\neg\lambda_{PollutionHigh} \vee \\
&\neg\lambda_{SmokerFalse} \vee \neg\rho_{CancerTrue|PollutionHigh,SmokerFalse} \vee \lambda_{CancerTrue}) \wedge \\
&(\neg\lambda_{PollutionHigh} \vee \neg\lambda_{SmokerFalse} \vee \rho_{CancerTrue|PollutionHigh,SmokerFalse} \vee \\
&\lambda_{CancerFalse}) \wedge (\neg\lambda_{CancerTrue} \vee \neg\rho_{XrayPositive|CancerTrue} \vee \lambda_{XrayPositive}) \wedge \\
&(\neg\lambda_{CancerTrue} \vee \rho_{XrayPositive|CancerTrue} \vee \lambda_{XrayNegative}) \wedge (\neg\lambda_{CancerFalse} \vee \\
&\neg\rho_{XrayPositive|CancerFalse} \vee \lambda_{XrayPositive}) \wedge (\neg\lambda_{CancerFalse} \vee \\
&\rho_{XrayPositive|CancerFalse} \vee \lambda_{XrayNegative}) \wedge (\neg\lambda_{CancerTrue} \vee \\
&\neg\rho_{DyspnoeaTrue|CancerTrue} \vee \lambda_{DyspnoeaTrue}) \wedge (\neg\lambda_{CancerTrue} \vee \\
&\rho_{DyspnoeaTrue|CancerTrue} \vee \lambda_{DyspnoeaFalse}) \wedge (\neg\lambda_{CancerFalse} \vee \\
&\neg\rho_{DyspnoeaTrue|CancerFalse} \vee \lambda_{DyspnoeaTrue}) \wedge (\neg\lambda_{CancerFalse} \vee \\
&\rho_{DyspnoeaTrue|CancerFalse} \vee \lambda_{DyspnoeaFalse})
\end{aligned}$$

Weights

$W(\lambda_{PollutionLow}) = 1.00$
 $W(\neg\lambda_{PollutionLow}) = 1.00$
 $W(\lambda_{PollutionHigh}) = 1.00$
 $W(\neg\lambda_{PollutionHigh}) = 1.00$
 $W(\lambda_{SmokerTrue}) = 1.00$
 $W(\neg\lambda_{SmokerTrue}) = 1.00$
 $W(\lambda_{SmokerFalse}) = 1.00$
 $W(\neg\lambda_{SmokerFalse}) = 1.00$
 $W(\lambda_{CancerTrue}) = 1.00$
 $W(\neg\lambda_{CancerTrue}) = 1.00$
 $W(\lambda_{CancerFalse}) = 1.00$
 $W(\neg\lambda_{CancerFalse}) = 1.00$
 $W(\lambda_{XrayPositive}) = 1.00$
 $W(\neg\lambda_{XrayPositive}) = 1.00$
 $W(\lambda_{XrayNegative}) = 1.00$
 $W(\neg\lambda_{XrayNegative}) = 1.00$
 $W(\lambda_{DyspnoeaTrue}) = 1.00$
 $W(\neg\lambda_{DyspnoeaTrue}) = 1.00$
 $W(\lambda_{DyspnoeaFalse}) = 1.00$
 $W(\neg\lambda_{DyspnoeaFalse}) = 1.00$
 $W(\rho_{PollutionLow}) = 0.90$
 $W(\neg\rho_{PollutionLow}) = 0.10$
 $W(\rho_{SmokerTrue}) = 0.30$
 $W(\neg\rho_{SmokerTrue}) = 0.70$
 $W(\rho_{CancerTrue|PollutionLow,SmokerTrue}) = 0.03$
 $W(\neg\rho_{CancerTrue|PollutionLow,SmokerTrue}) = 0.97$
 $W(\rho_{CancerTrue|PollutionLow,SmokerFalse}) = 0.00$
 $W(\neg\rho_{CancerTrue|PollutionLow,SmokerFalse}) = 1.00$
 $W(\rho_{CancerTrue|PollutionHigh,SmokerTrue}) = 0.05$
 $W(\neg\rho_{CancerTrue|PollutionHigh,SmokerTrue}) = 0.95$
 $W(\rho_{CancerTrue|PollutionHigh,SmokerFalse}) = 0.02$
 $W(\neg\rho_{CancerTrue|PollutionHigh,SmokerFalse}) = 0.98$
 $W(\rho_{XrayPositive|CancerTrue}) = 0.90$
 $W(\neg\rho_{XrayPositive|CancerTrue}) = 0.10$
 $W(\rho_{XrayPositive|CancerFalse}) = 0.20$
 $W(\neg\rho_{XrayPositive|CancerFalse}) = 0.80$
 $W(\rho_{DyspnoeaTrue|CancerTrue}) = 0.65$
 $W(\neg\rho_{DyspnoeaTrue|CancerTrue}) = 0.35$
 $W(\rho_{DyspnoeaTrue|CancerFalse}) = 0.30$
 $W(\neg\rho_{DyspnoeaTrue|CancerFalse}) = 0.70$

1.2

The CNF of the monty hall problem is given in image 1

```

=====
CNF:
select_door(1)
^ win_keep v -prize(1)
^ -win_keep v prize(1)
^ open_door(2) v prize(2) v -prize(3)
^ -open_door(2) v -prize(2)
^ -open_door(2) v prize(3)
^ open_door(3) v prize(3) v -prize(2)
^ -open_door(3) v -prize(3)
^ -open_door(3) v prize(2)
^ win_switch v -prize(2) v open_door(2)
^ win_switch v -prize(3) v open_door(3)
^ -win_switch v prize(2) v prize(3)
^ -win_switch v prize(2) v -open_door(3)
^ -win_switch v -open_door(2) v prize(3)
^ -win_switch v -open_door(2) v -open_door(3)
Queries:
query(prize(1))
query(prize(2))
query(prize(3))
query(select_door(1))
query(win_keep)
query(win_switch)
=====

```

Figure 1.1: Grounder problog cnf

1.3

1

We will use mini2CD and Cachet as WMC counters.

mini2CD

Cachet

2. Difference between WMC's

The three WMC we will compare are C2D, Cachet and SharpSAT.

C2D Vs Cachet

The biggest difference between C2D and Cachet is that C2D keeps a track of the operation it has performed. This means that Cachet is not a compiler but C2D is. In [1] they note that Cachet could easily be transformed into a compiler. There are some other minor differences like they have a different way to implement decompositions but they also do variable splitting and caching in a different way.

SharpSAT vs Cachet

SharpSAT has an efficient way to cache components. This cache has a limited size and removes old entries using an utility function. It also uses implicit boolean constraint propagation (BCP). This results in a smaller search space and reduces the cache size further. SharpSAT also inherits different techniques from conventional SAT solvers. It inherits a clause learning and a fast BCP algorithm. It also has some things in common with Cachet: For selecting the branch variables, SharpSAT applies the VSADS algorithm from Cachet. Cachet

uses a string representation for components while SharpSAT uses a smart coding to store its components in a cache. [2].

C2D vs SharpSAT

The biggest difference between these two is that C2D is a compiler. A point they have in common is that they both use things from the literature. C2D creates a tree while SharpSAT doesn't.

3 Overview of computational requirements

NOG DOEN.

Bibliography

- [1] Mark Chavira and Adnan Darwiche. On probabilistic inference by weighted model counting. *Artificial Intelligence*, 172(6):772 – 799, 2008.
- [2] Marc Thurley. sharpsat - counting models with advanced component caching and implicit bcp. *Proceedings of the 9th International Conference on Theory and Applications of Satisfiability Testing (SAT 2006)*, pages 424–429, 2006.