CS420 – Artificial Intelligence

Class: 18CTT

Report
Lab02: Resolution in Propositional Logic

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1. Progress

#	Criteria	% credits	Done
1	Manipulate the input and output	20	x
2	Implement the PL-Resolution	10	x
3	Implement the David-Putnam algorithm	10	x
4	Provide valid results for the PL-Resolution	20	x
5	Provide valid results for the David-Putnam algorithm	20	x
6	Report sufficient information in the document	20	x

2. Language:

- Python

3. Structure of submission

The source code is in folder “Source” with the name “18125046.py”.

We can run the implementation with the command
“python 18125046.py --inp <input> --out <output> --mode <mode>”

Where the input data is stored in <input> and the write to file <output>. There are two modes to select: “p” for PL-Resolution and “d” for David-Putman procedure.

4. Result

- My detailed result is described in the table below:

	Input	PL Resolution		DP	
		Output	**Number of resolves**	**Output**	**Number of resolves**
1	-A 4 -A OR B B OR -C A OR -B OR C -B	3 -A -C B 4 -B OR C {} A OR -B A OR C YES	38	3 B OR -C -B B 2 -C {} YES	20
2	A 4 -A OR B B OR -C A OR -B OR C -B	2 -C -B OR C 2 A OR -B -A OR C 1 A OR -C 0 NO	112	3 B OR -C -B C OR -B 1 -C 0 NO	22
3	U 5 P OR Q -Q OR R -Q OR S -P OR U -R OR U	6 P OR R P OR S Q OR U -Q OR U -P -R 8 R OR U P OR U S OR U Q -Q R S P 2 U {} YES	271	5 -Q OR R -Q OR S -R OR U -U Q OR U 4 -R OR U -U R OR U S OR U 3 -U S OR U U 2 -U U 1 {} YES	45
4	-U 5	4 P OR R	138	5 -Q OR R	40

	P OR Q -Q OR R -Q OR S -P OR U -R OR U	P OR S Q OR U -Q OR U 3 R OR U P OR U S OR U 0 NO		-Q OR S -R OR U U Q OR U 4 -R OR U U R OR U S OR U 2 U S OR U 1 U 0 NO	
5	-F 4 A OR -I -W OR I -A W OR I OR F	3 A OR -W -I A OR F OR W 3 -W A OR F OR I F OR W 2 F OR I A OR F 0 NO	171	4 -W OR I W OR I OR F F -I 2 -W OR I -I 1 -W 0 NO	26

- Below is a chart of the number of resolves to illustrate the complexity of PL resolution and DP procedure.