Results considering different values for parent sets number

May 8, 2023

1 Asia network

Configuration for **asia**:

- number of nodes: 8
- number of arcs: 8
- number of parameters: 18
- average degree: 2
- maximum in-degree: 2
- number of samples of train dataset: 100
- number of samples of test dataset: 10000
- number of iterations: 105
- parent sets size: {10, 20, 30, 40}

		V1		V2		V3		V4		V5	
		train	test	train	test	train	test	train	test		
bnlearn		-269.3	-233.3	-247.5	-234.0	-240.7	-229.3	-274.9	-232.0	-271.5	-229.2
np = 10	normal	-246.9	-199.0	-229.8	-202.9	-220.7	-198.9	-239.1	-197.2	-246.9	-199.0
	avg		-190.5		-218.1		-188.7		-211.2		-190.5
	bay		-216.8		-220.2		-214.8		-212.0		-216.8
np = 20	normal	-239.1	**-192.2**	-226.4	-200.9	-216.3	-195.5	-237.5	-195.4	-239.1	**-192.2**
	avg		**-190.3**		-213.8		-192.0		-209.6		**-190.3**
	bay		**-210.0**		-217.5		-212.7		-211.1		**-210.0**
np = 30	normal	-244.7	-200.5	-226.0	-200.9	-216.7	-198.7	-240.5	**-195.0**	-244.7	-200.5
	avg		-191.3		-212.3		-191.5		**-188.9**		-191.3
	bay		-218.3		-218.1		-215.2		**-210.9**		-218.3
np = 40	normal	-238.1	-199.8	-226.6	-200.8	-214.7	-198.1	-235.9	-198.0	-238.1	-199.8
	avg		-190.6		-190.9		-189.4		-189.0		-190.6
	bay		-217.3		-217.7		-214.5		-213.9		-217.3

1.1 Graphics of evolution for variant 1

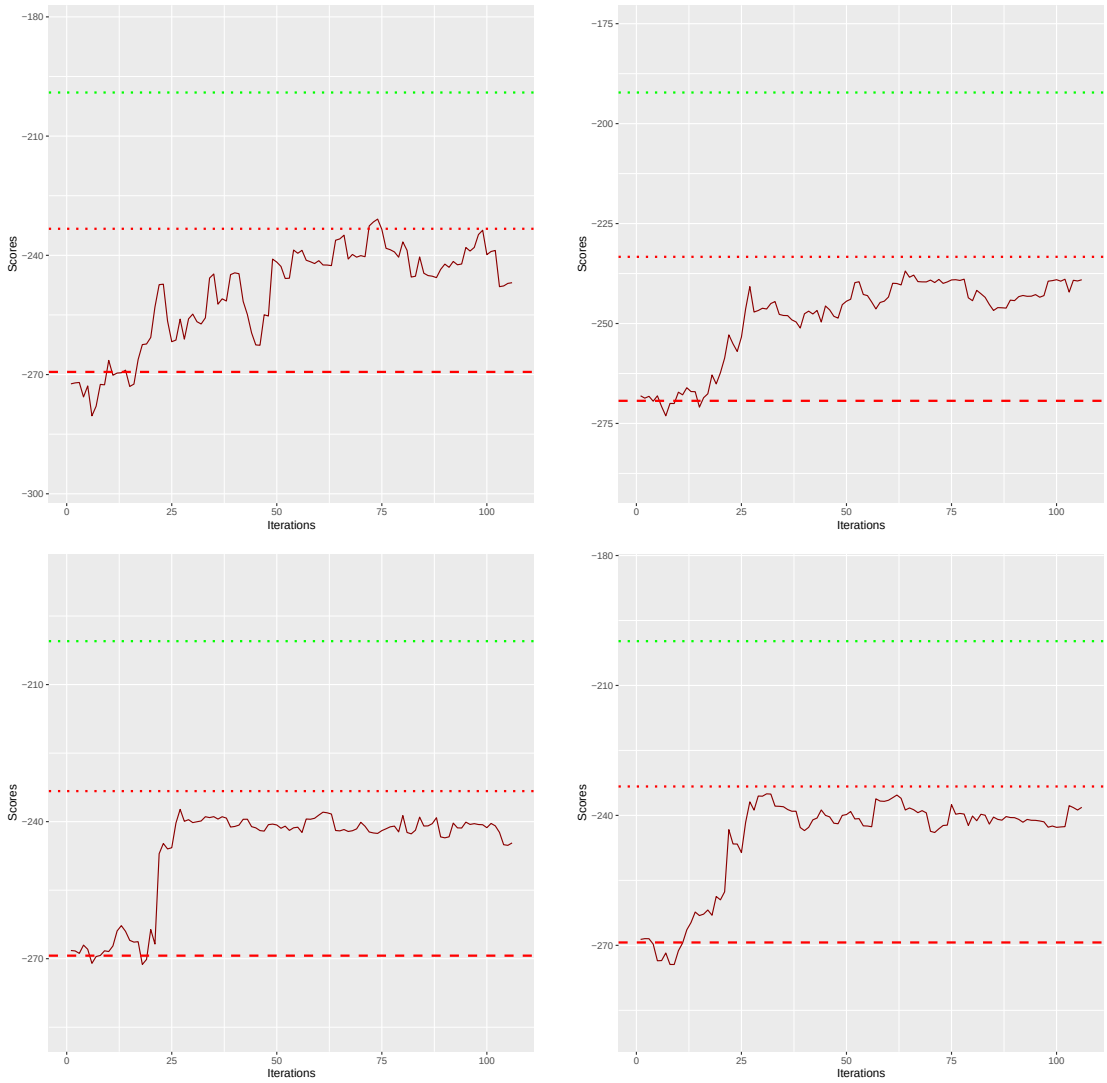

Table 1: Normal score for variant 1 with **np = 10, 20, 30, 40**

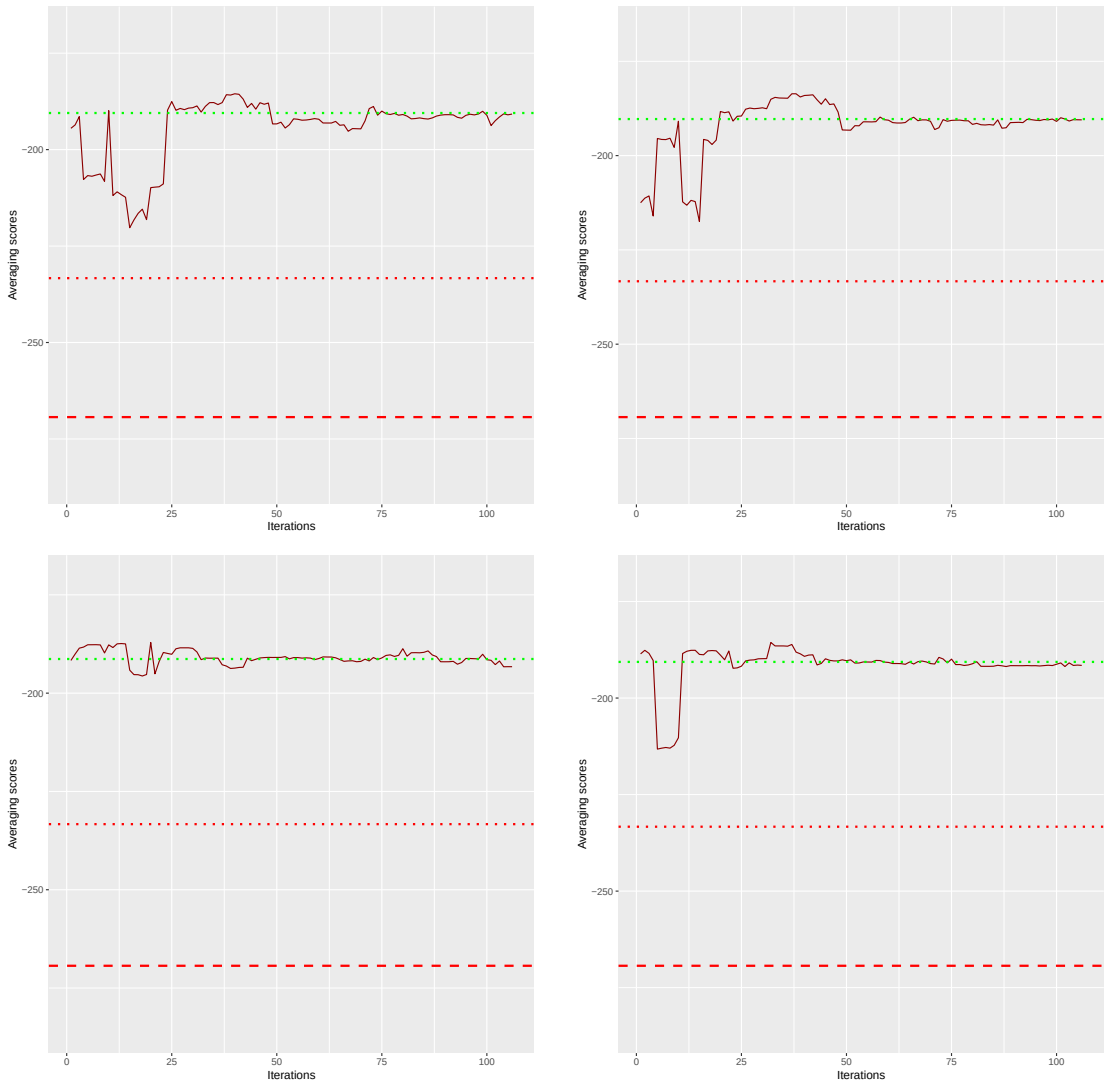

Table 2: Averaging score for variant 1 with **np = 10, 20, 30, 40**

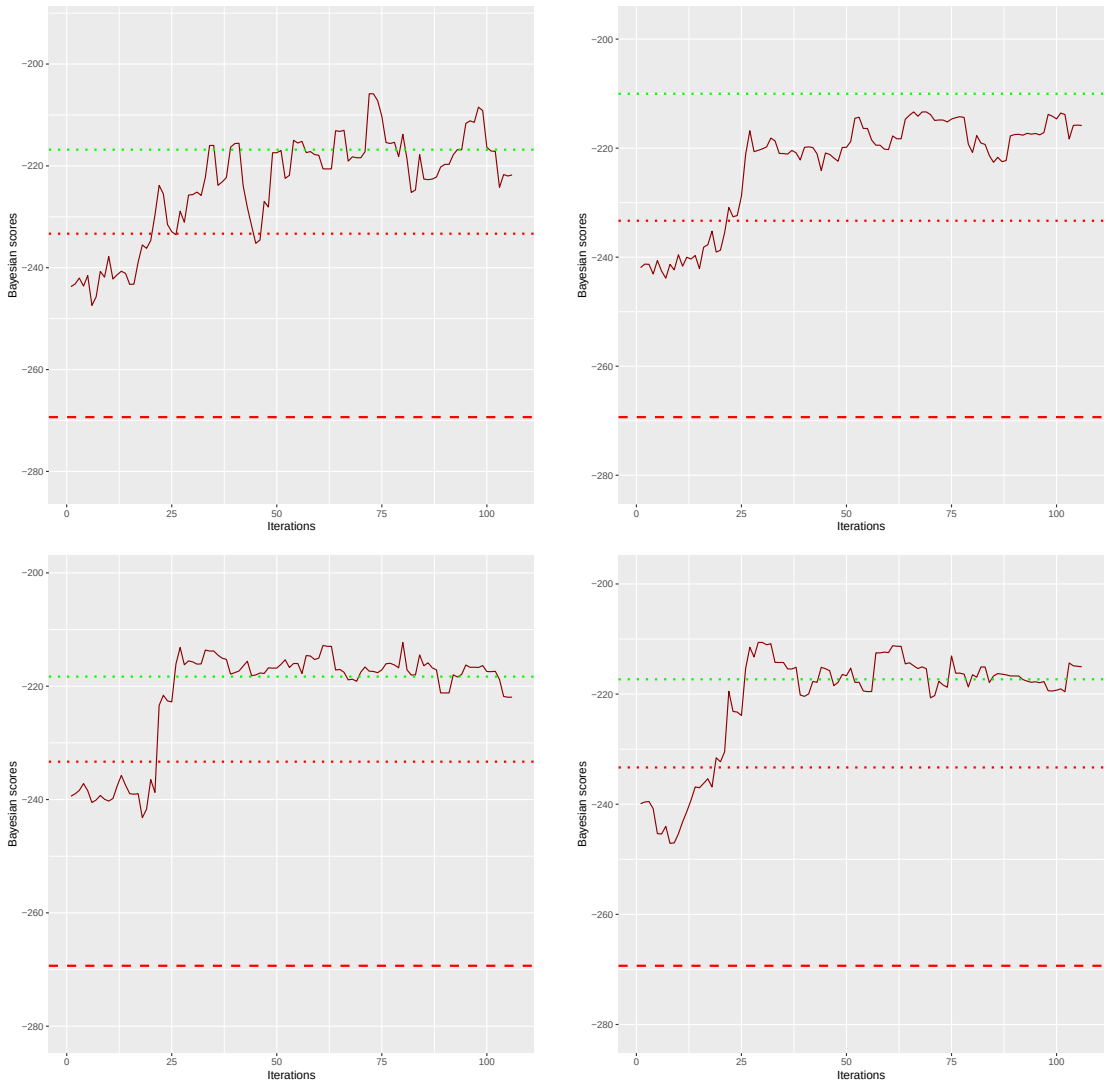

Table 3: Bayesian score for variant 1 with **np = 10, 20, 30, 40**

1.2 Graphics of evolution for variant 2

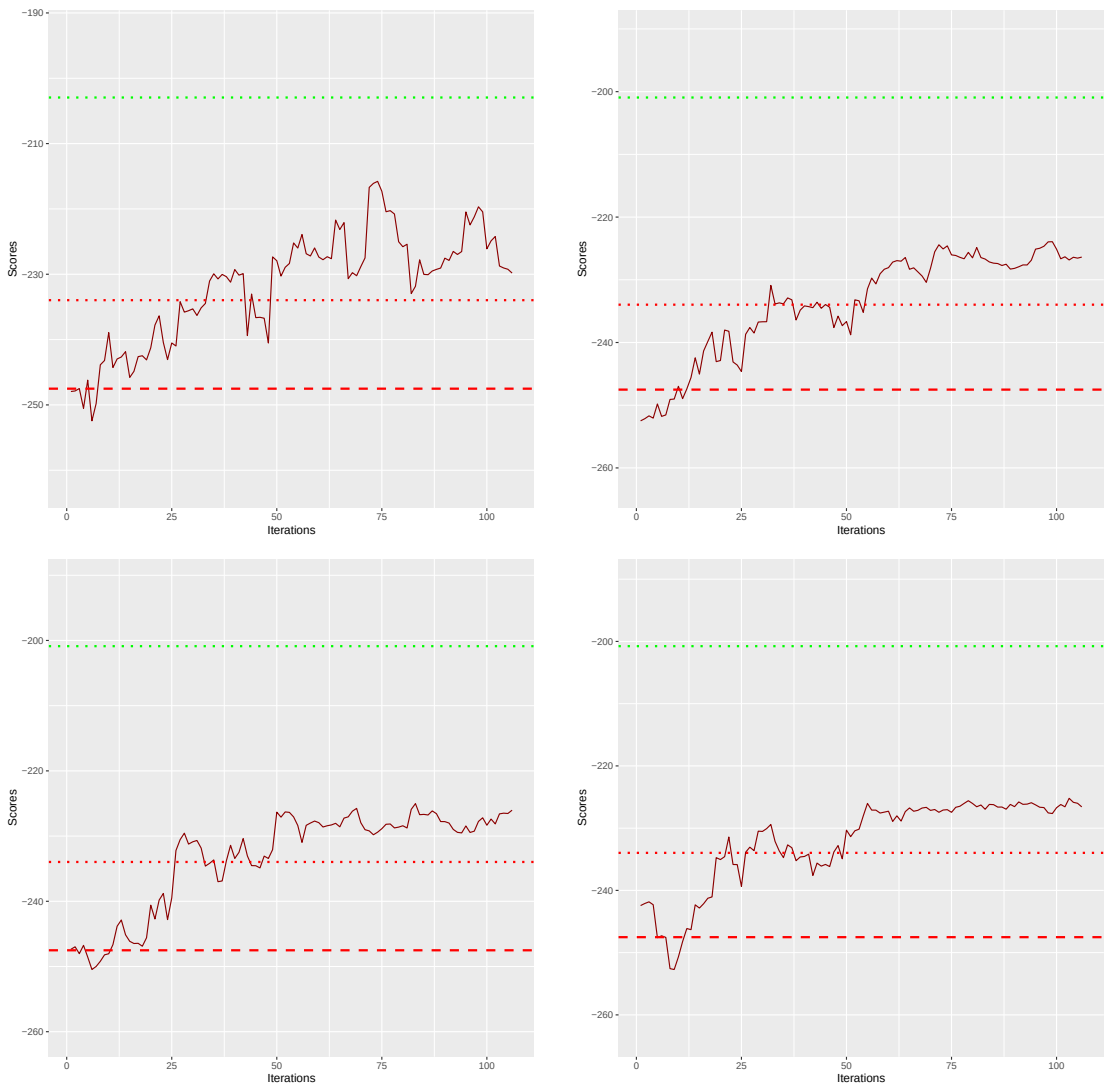

Table 4: Normal score for variant 2 with **np = 10, 20, 30, 40**

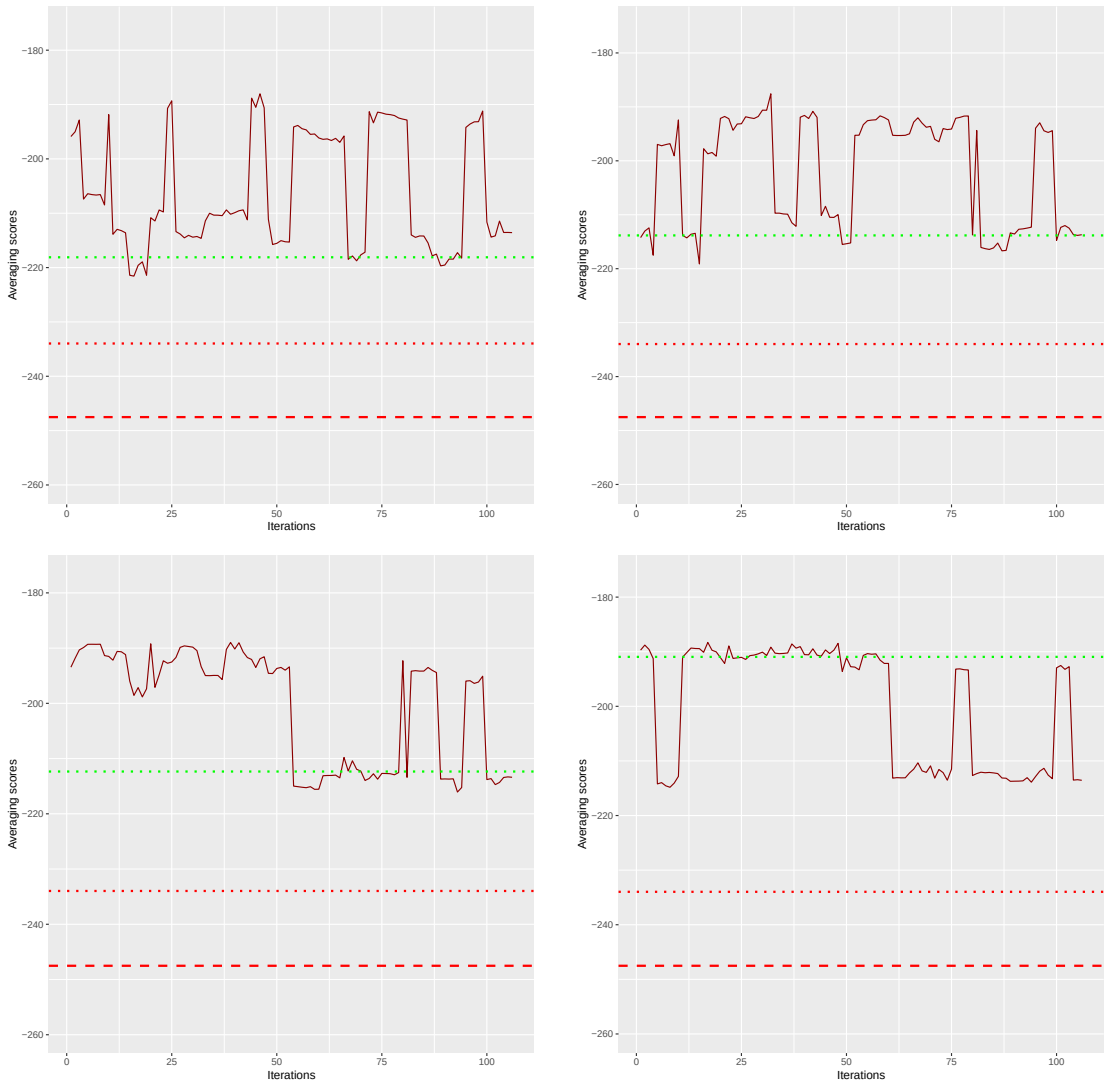

Table 5: Averaging score for variant 2 with **np = 10, 20, 30, 40**

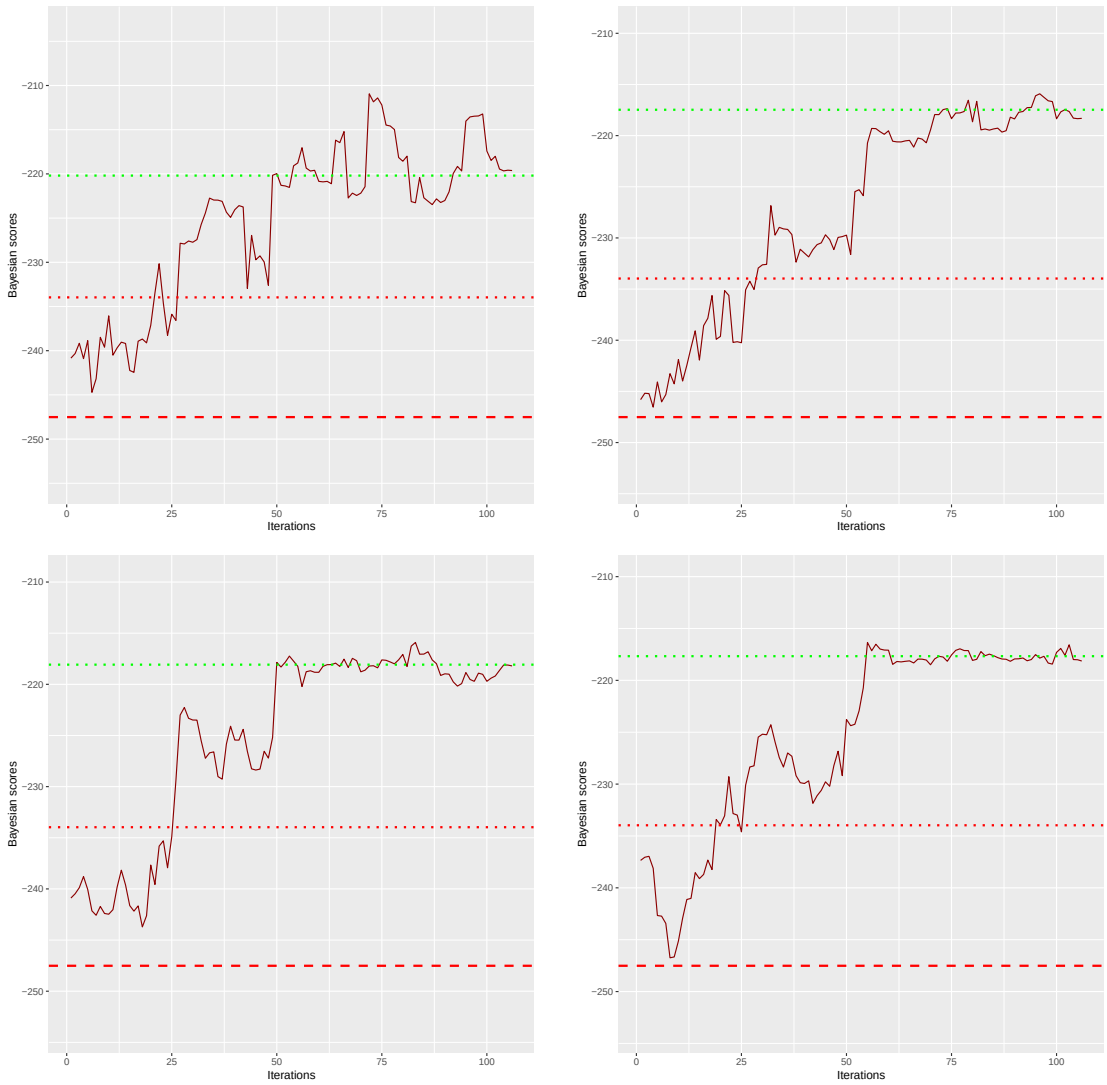

Table 6: Bayesian score for variant 2 with **np = 10, 20, 30, 40**

1.3 Graphics of evolution for variant 3

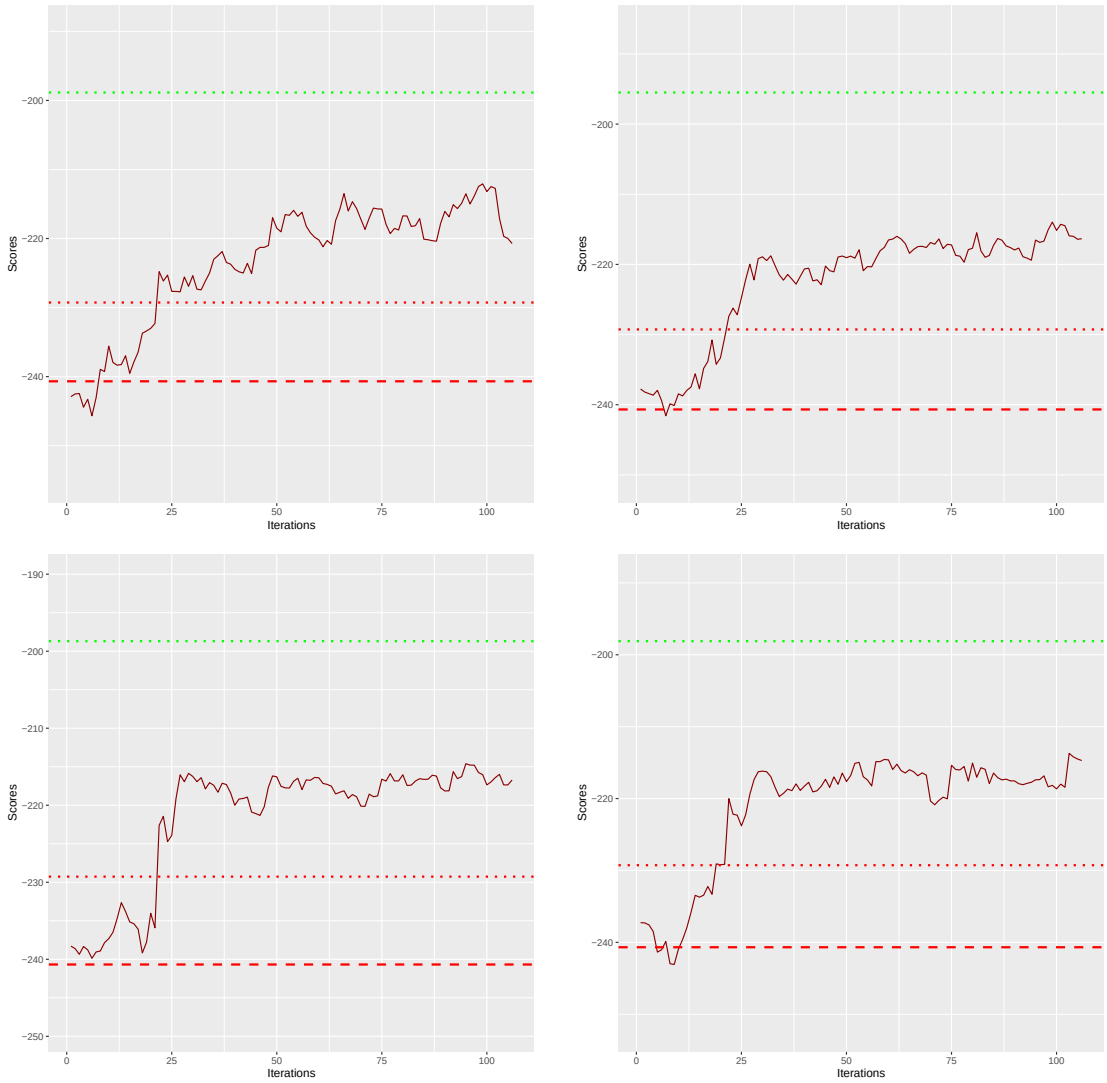

Table 7: Normal score for variant 3 with **np = 10, 20, 30, 40**

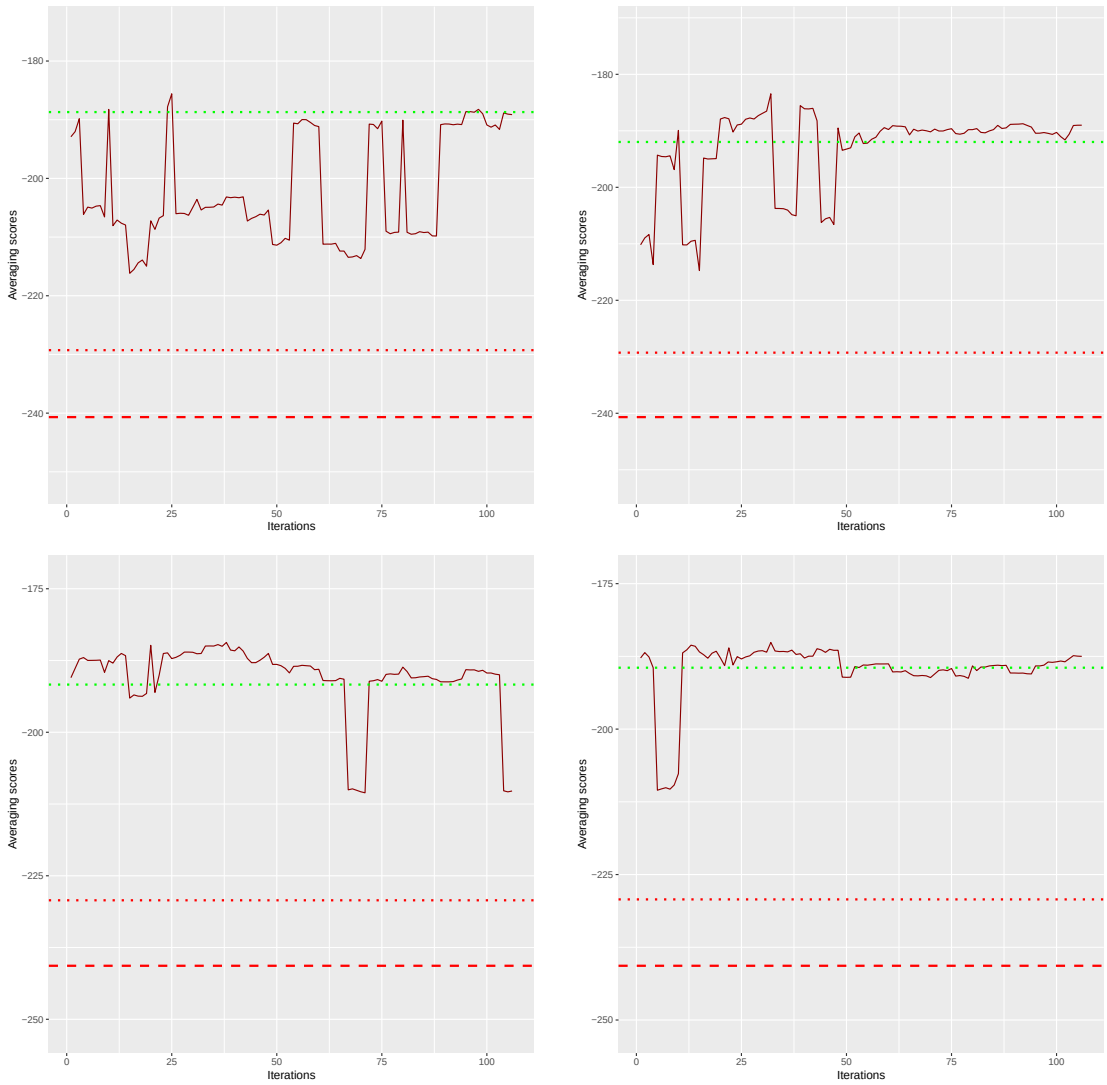

Table 8: Averaging score for variant 3 with **np = 10, 20, 30, 40**

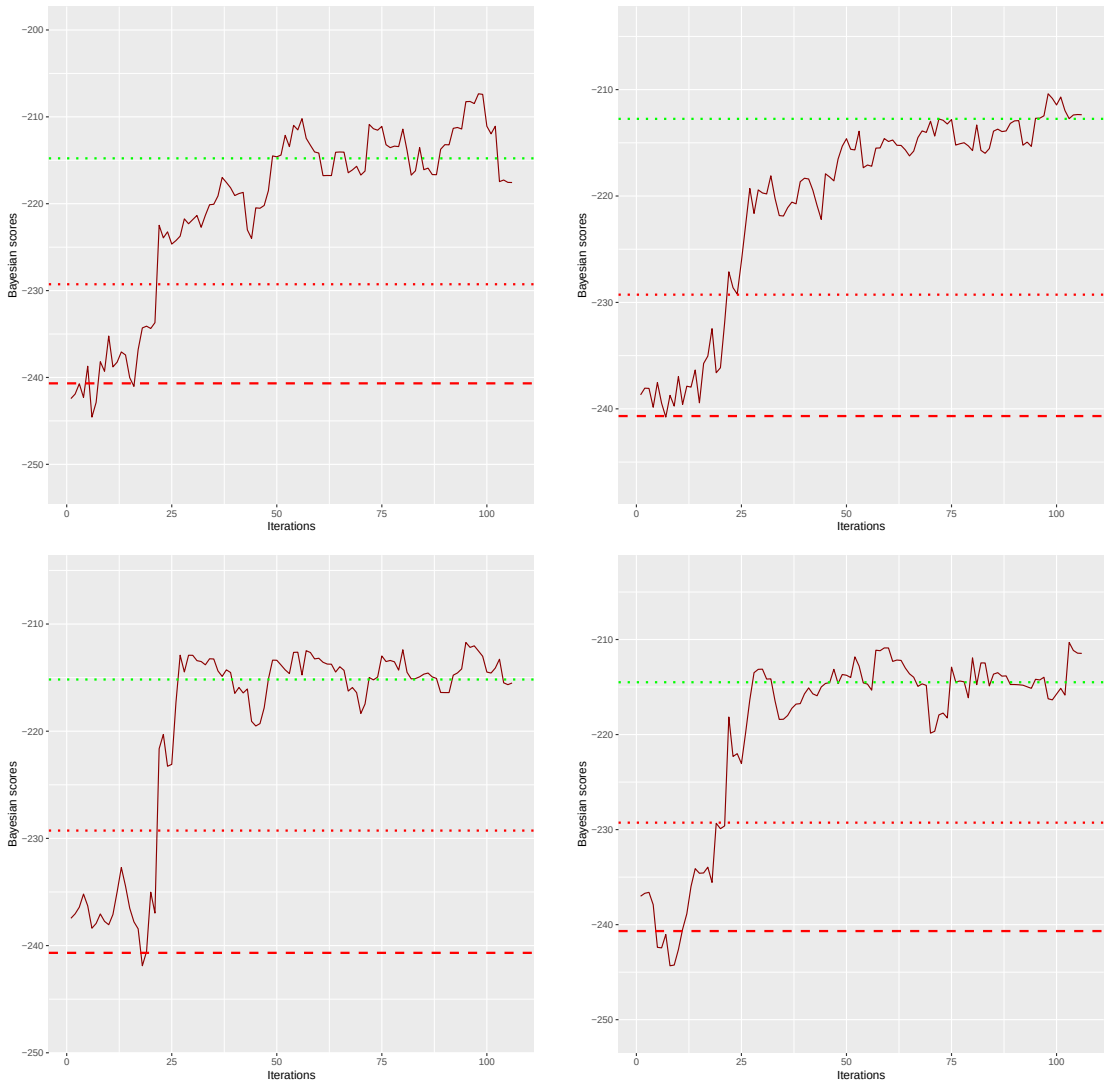

Table 9: Bayesian score for variant 3 with **np = 10, 20, 30, 40**

1.4 Graphics of evolution for variant 4

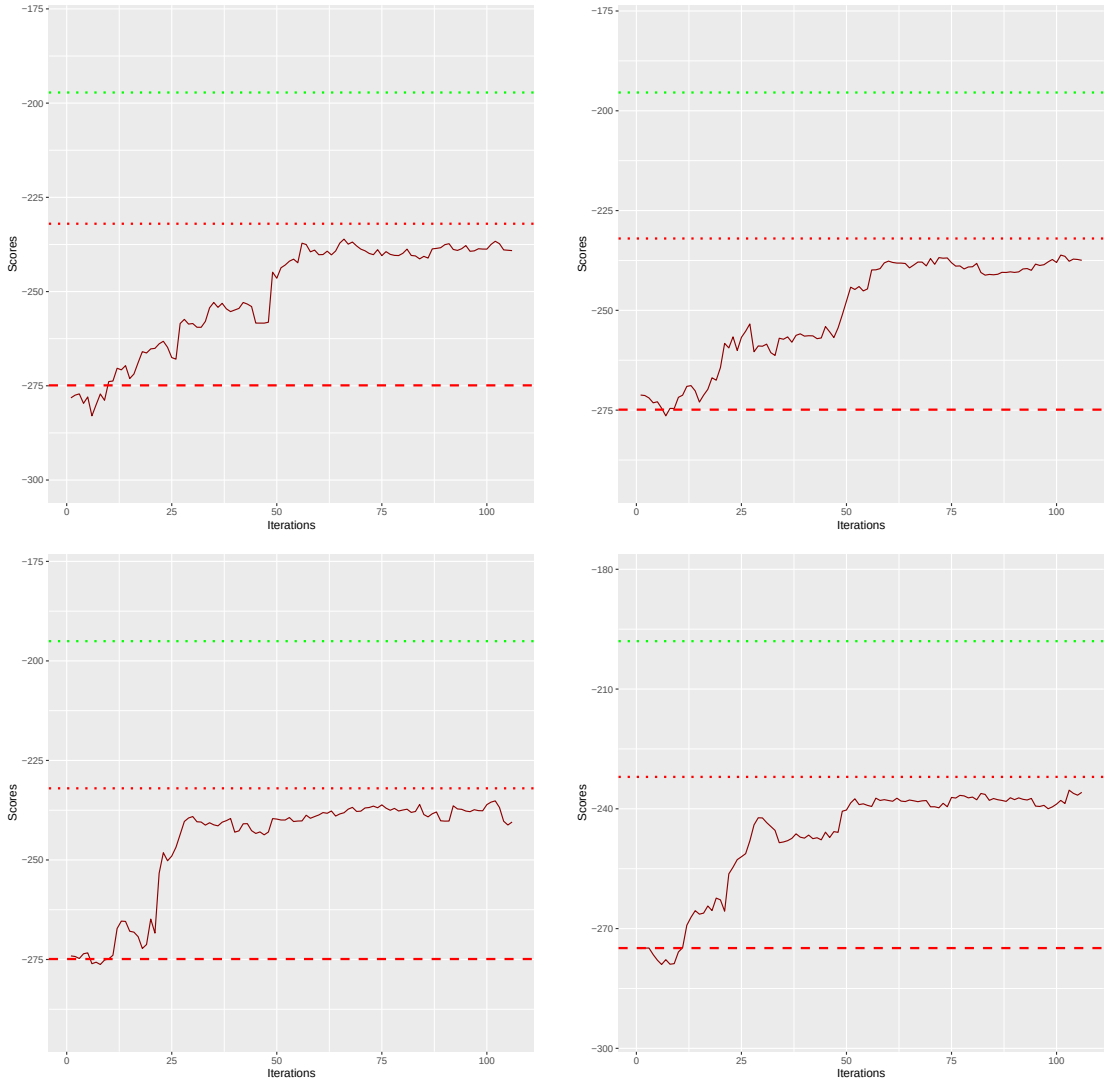

Table 10: Normal score for variant 4 with **np = 10, 20, 30, 40**

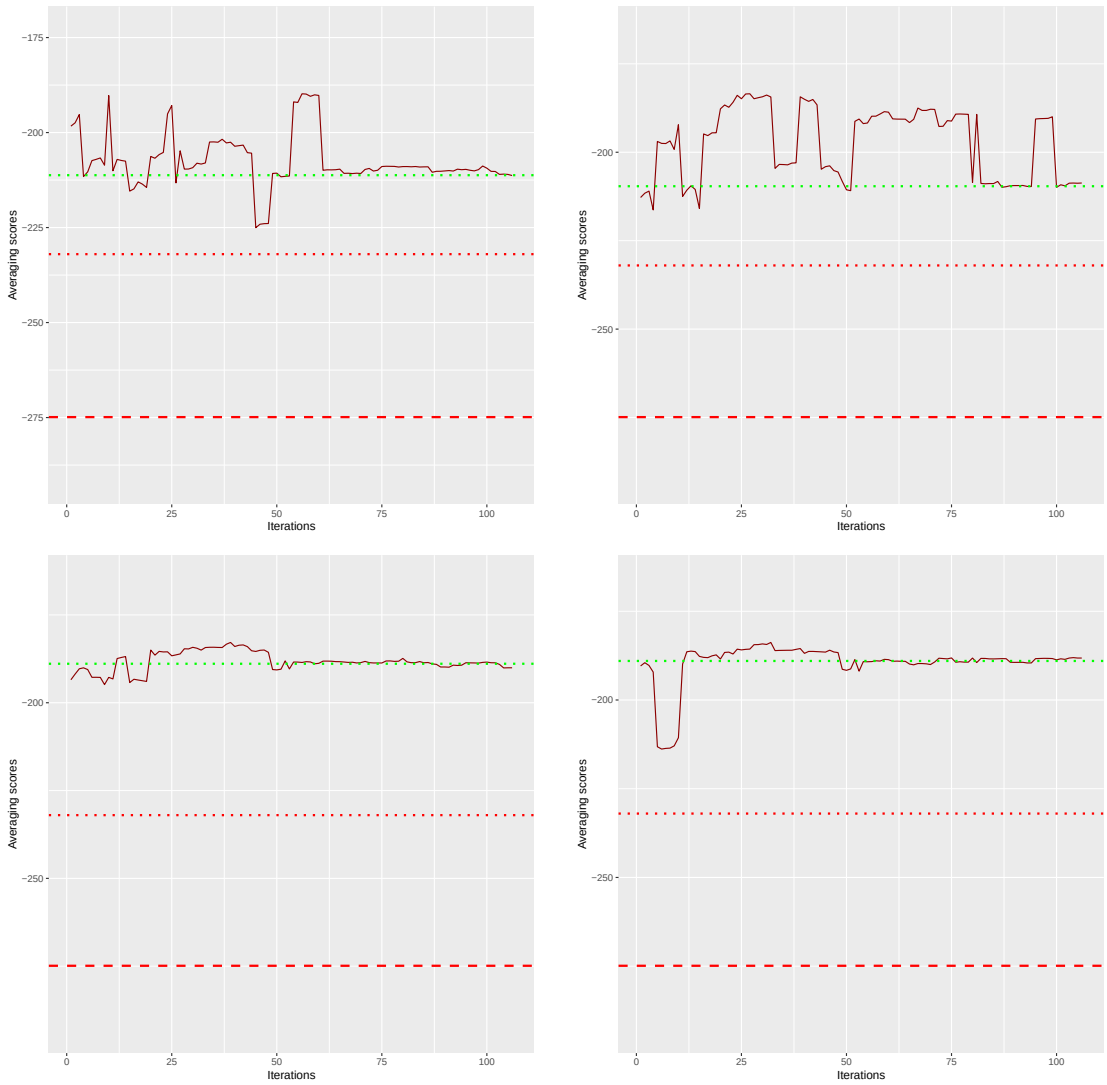

Table 11: Averaging score for variant 4 with **np = 10, 20, 30, 40**

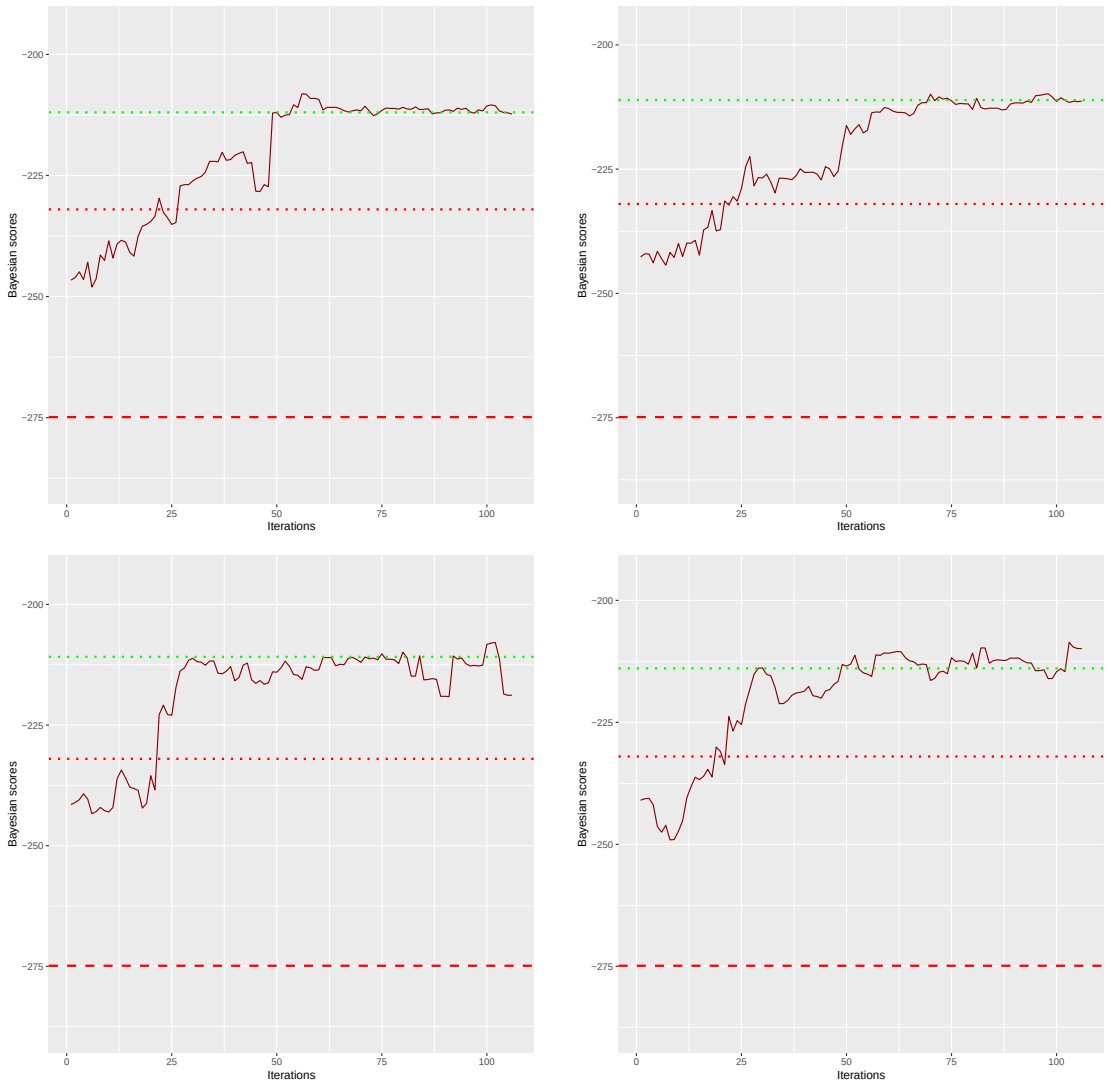

Table 12: Bayesian score for variant 4 with **np = 10, 20, 30, 40**

1.5 Graphics of evolution for variant 5

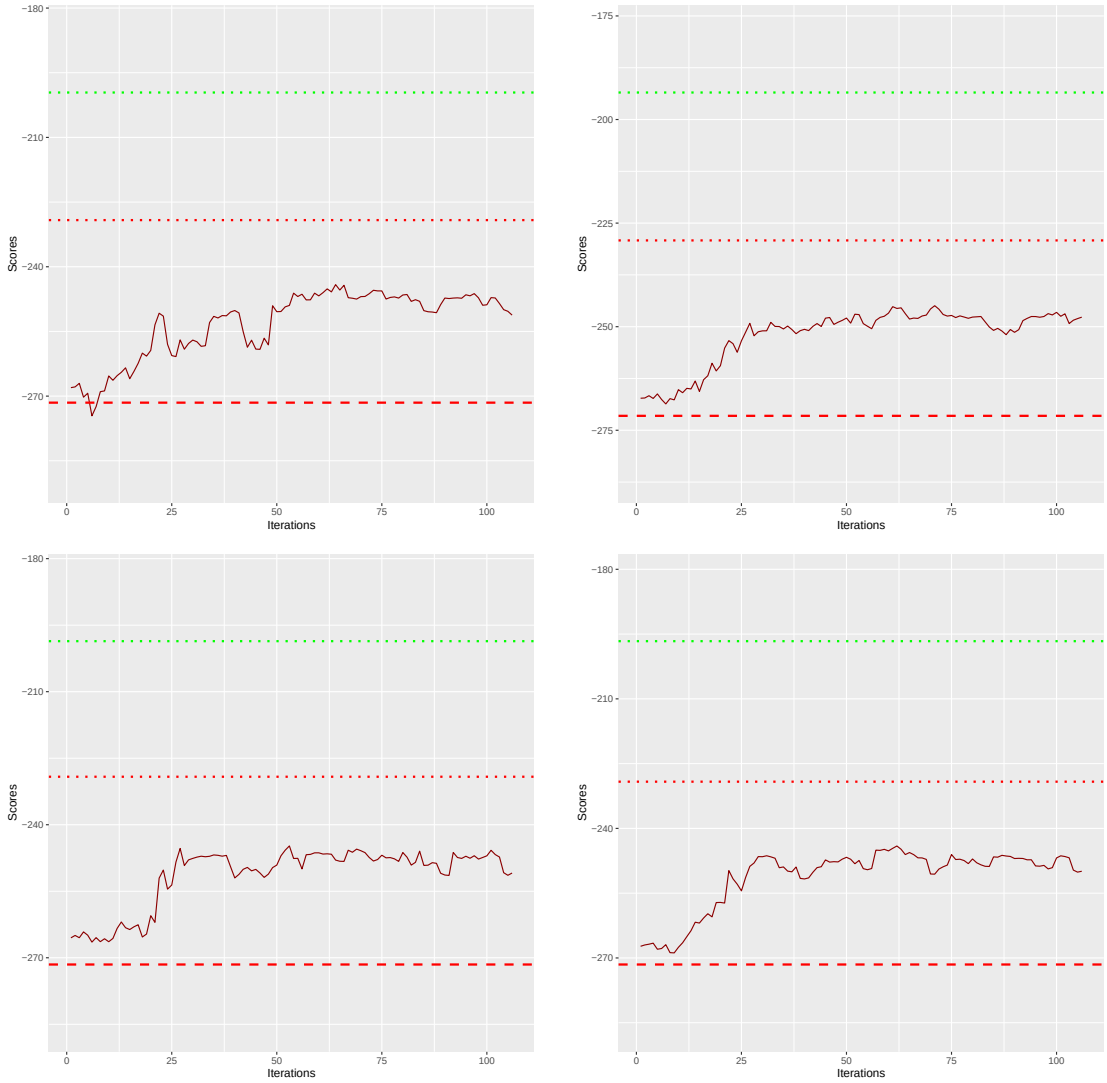

Table 13: Normal score for variant 5 with **np = 10, 20, 30, 40**

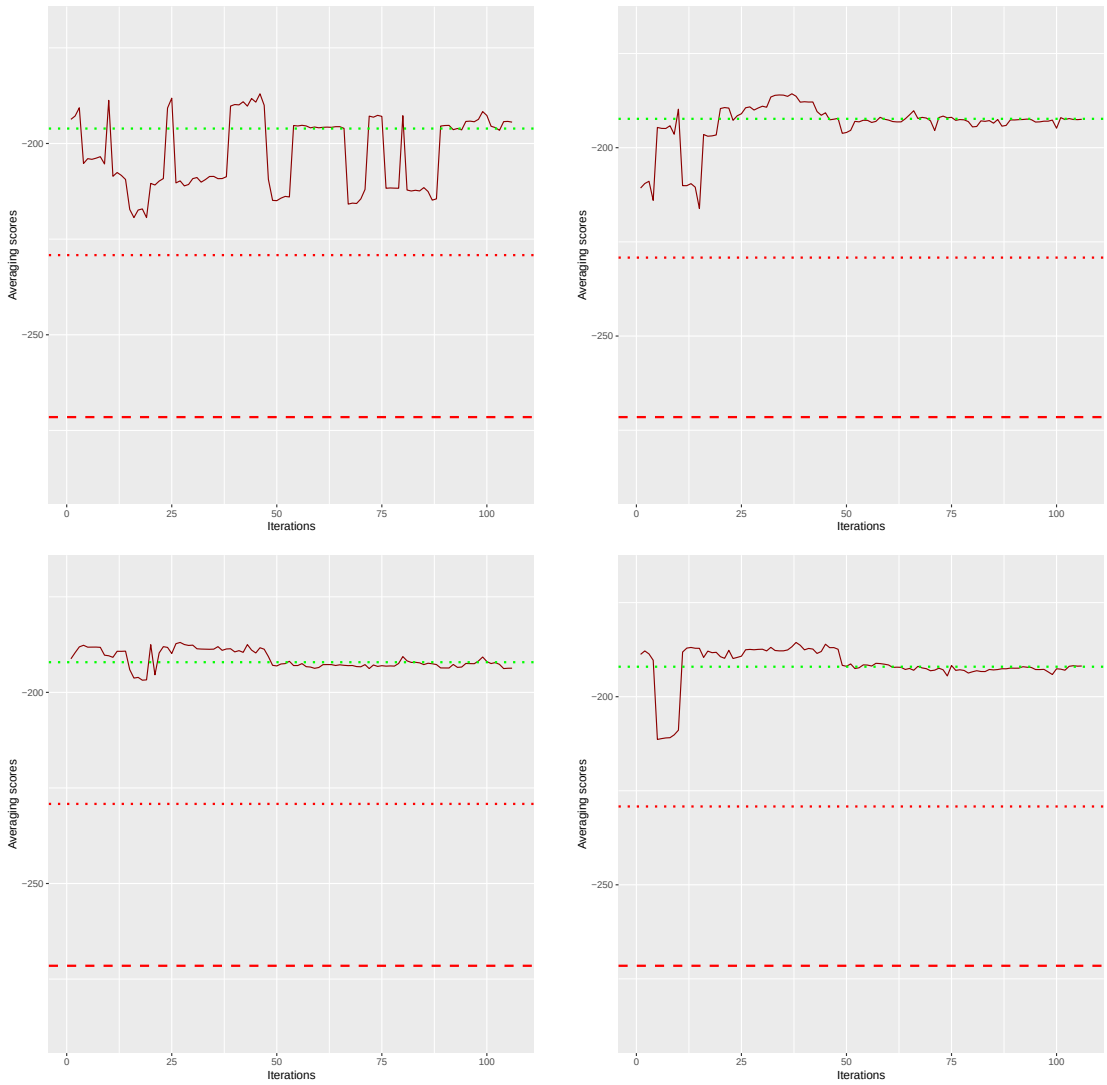

Table 14: Averaging score for variant 5 with **np = 10, 20, 30, 40**

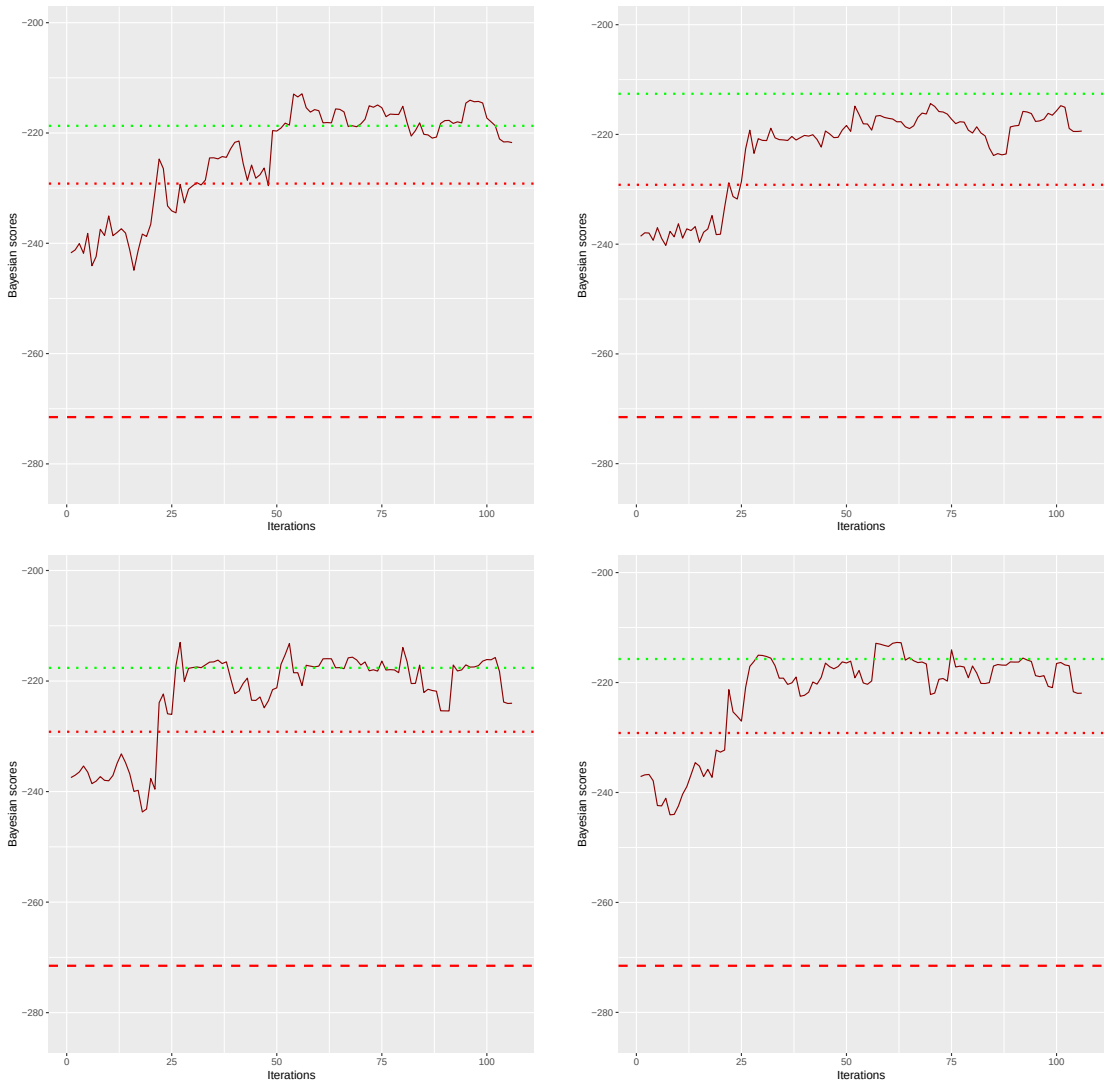

Table 15: Bayesian score for variant 5 with **np = 10, 20, 30, 40**

2 Alarm network

Configuration for **alarm**:

- number of nodes: 37
- number of arcs: 46
- number of parameters: 509
- average degree: 2.49
- maximum in-degree: 4
- number of samples of tain dataset: 3500
- number of samples of test dataset: 10000
- number of iterations: 3500
- parent sets size: {30, 50, 70, 90}

		V1		V2		V3		V4		V5	
	train	test	train	test	train	test	train	test	train	test	
bnlearn		-6900	-6577	-7042	-6738	-7026	-6712	-7080	-6730	-7188	-6651
	normal	-5685	-5265	-5882	-5345	-5759	**-5220**	-5783	-5192	-5918	-5284
np = 30	avg		-5214		-5333		**-5217**		-5138		-5193
	bay		-5293		-5382		**-5256**		-5224		-5318
	normal	-5693	-5251	-5977	-5394	-5732	-5229	-5867	-5301	-6017	-5359
np = 50	avg		-5210		-5348		-5233		-5212		-5235
	bay		-5281		-5428		-5264		-5332		-5392
	normal	-5713	-5251	-5870	**-5317**	-5769	-5286	-5843	-5239	-5933	-5311
np = 70	avg		-5127		**-5291**		-5264		-5107		-5153
	bay		-5280		**-5353**		-5319		-5272		-5343
	normal	-5697	-5257	-5950	-5364	-5727	-5247	-5878	-5287	-6000	-5367
np = 90	avg		-5180		-5214		-5232		-5124		-5234
	bay		-5289		-5403		-5282		-5321		-5401

2.1 Graphics of evolution for variant 1

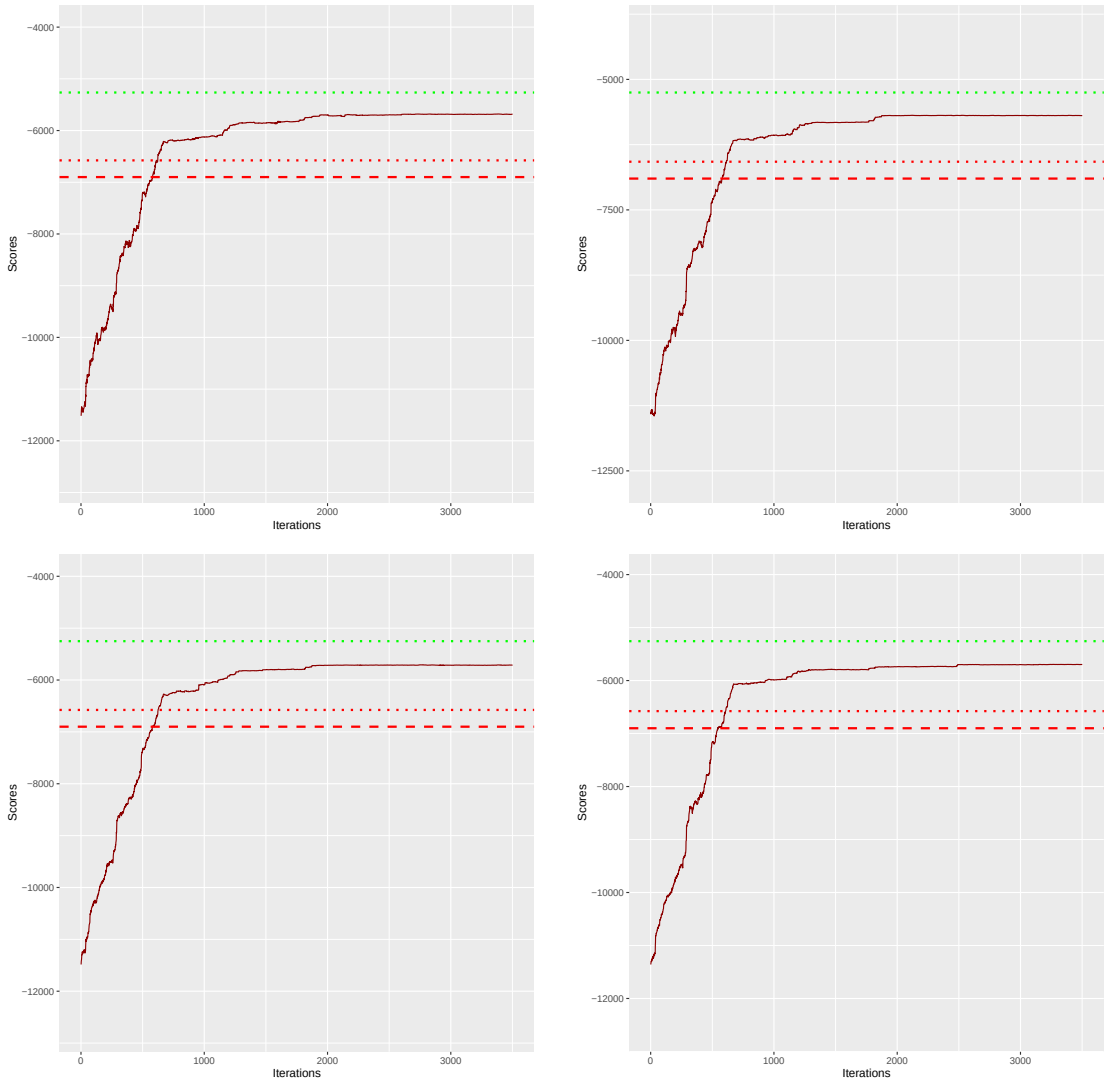

Table 16: Normal score for variant 1 with **np = 30, 50, 70, 90**

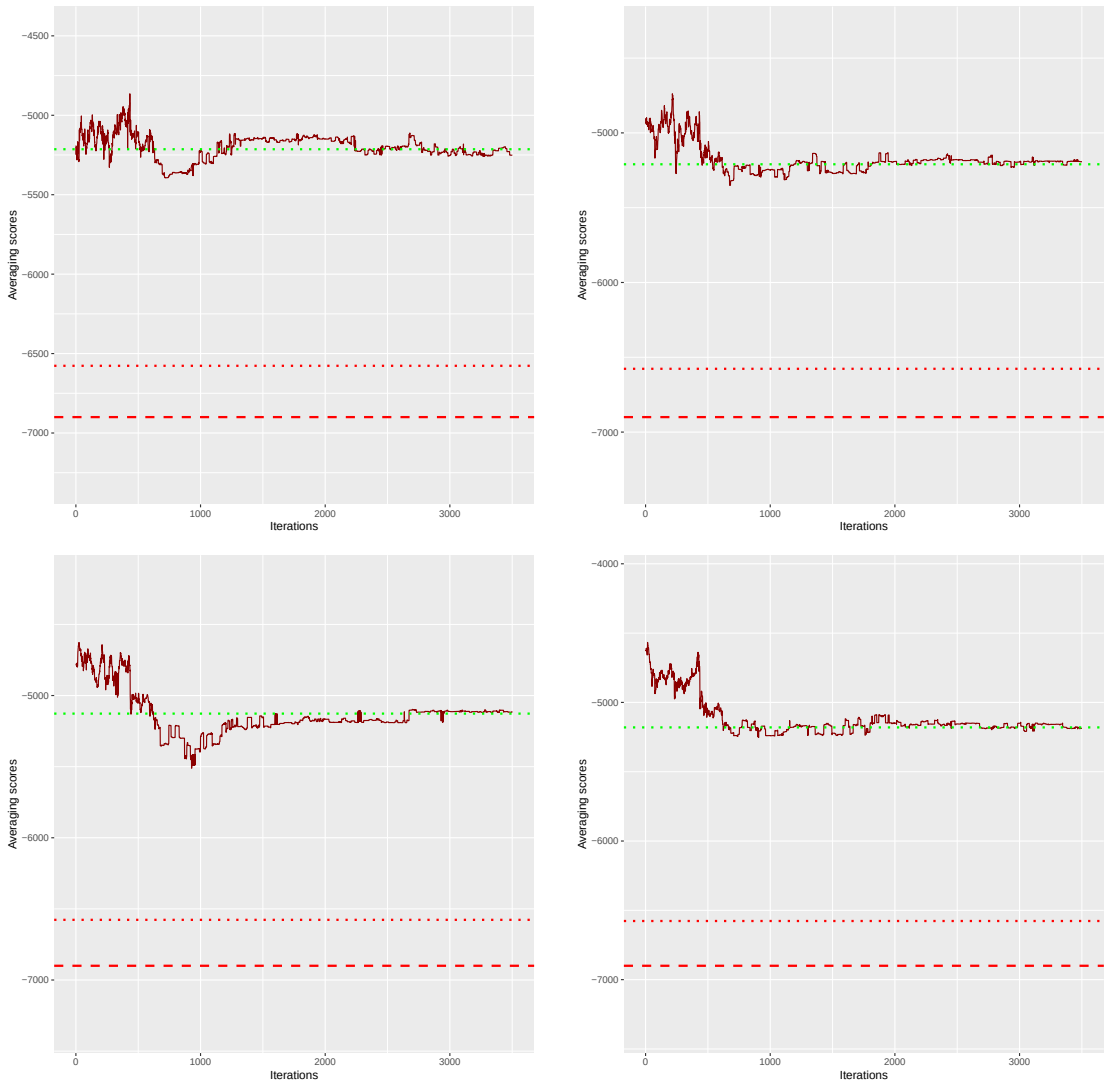

Table 17: Averaging score for variant 1 with **np = 30, 50, 70, 90**

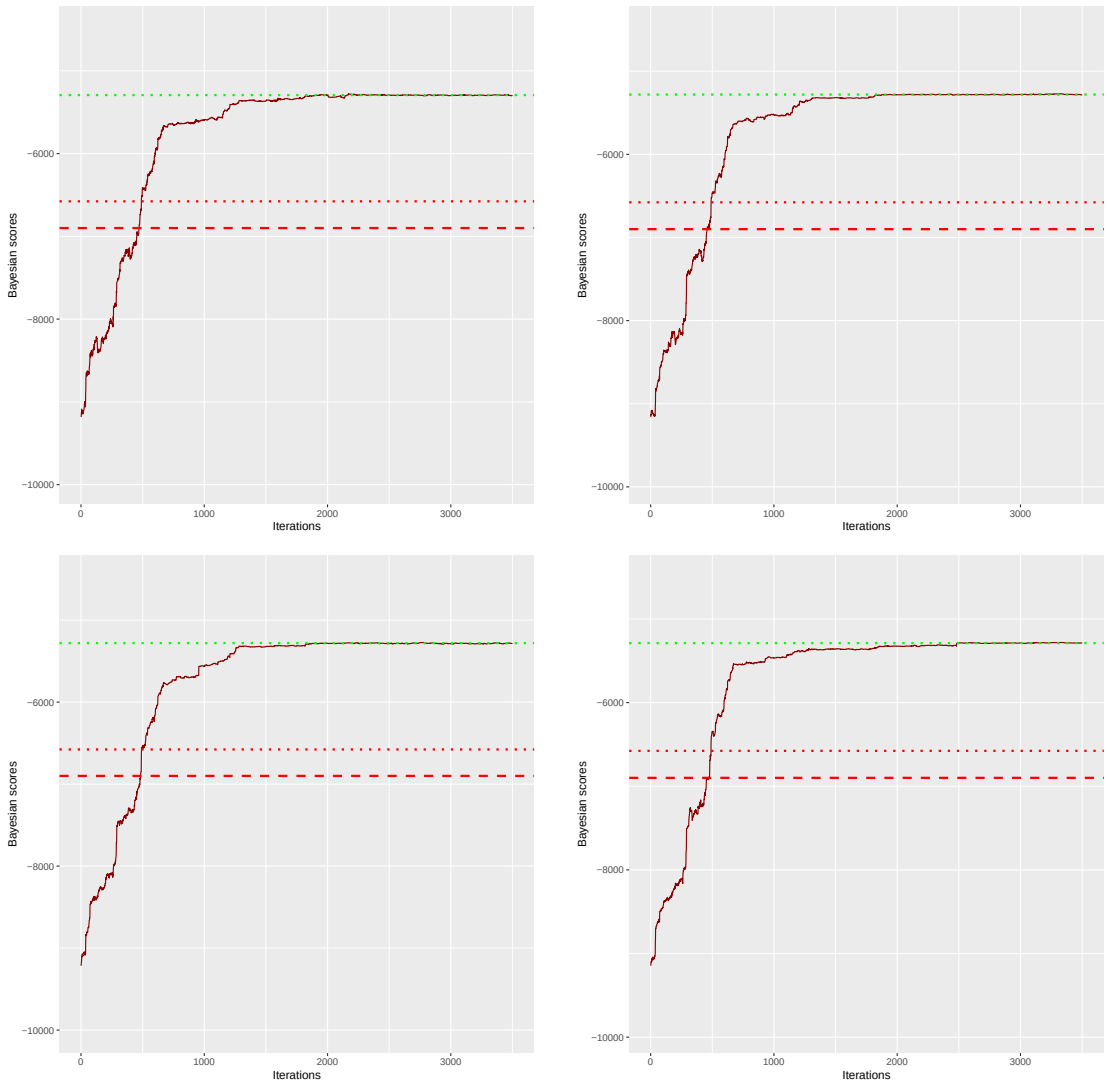

Table 18: Bayesian score for variant 1 with **np = 30, 50, 70, 90**

2.2 Graphics of evolution for variant 2

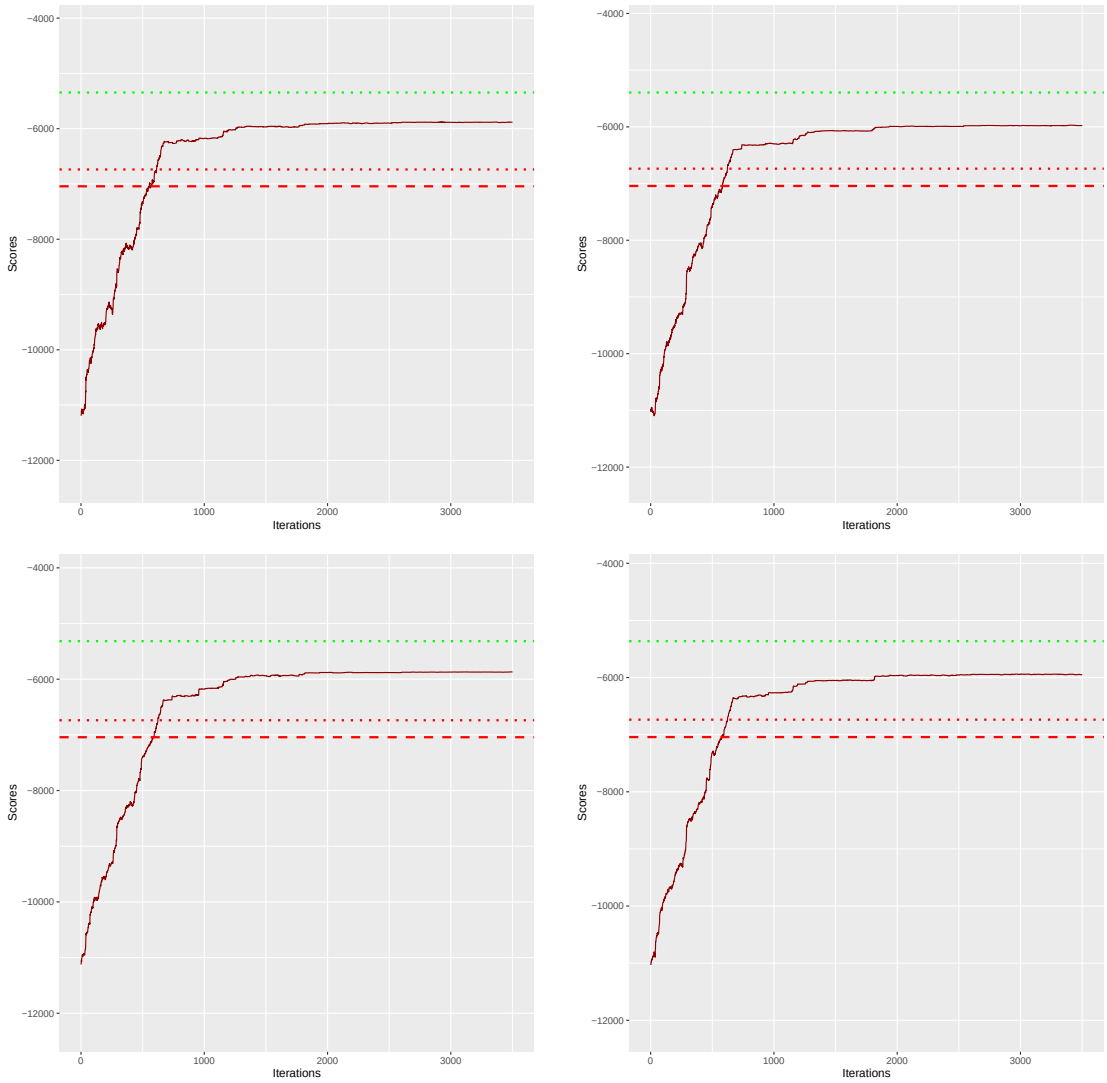

Table 19: Normal score for variant 2 with **np = 30, 50, 70, 90**

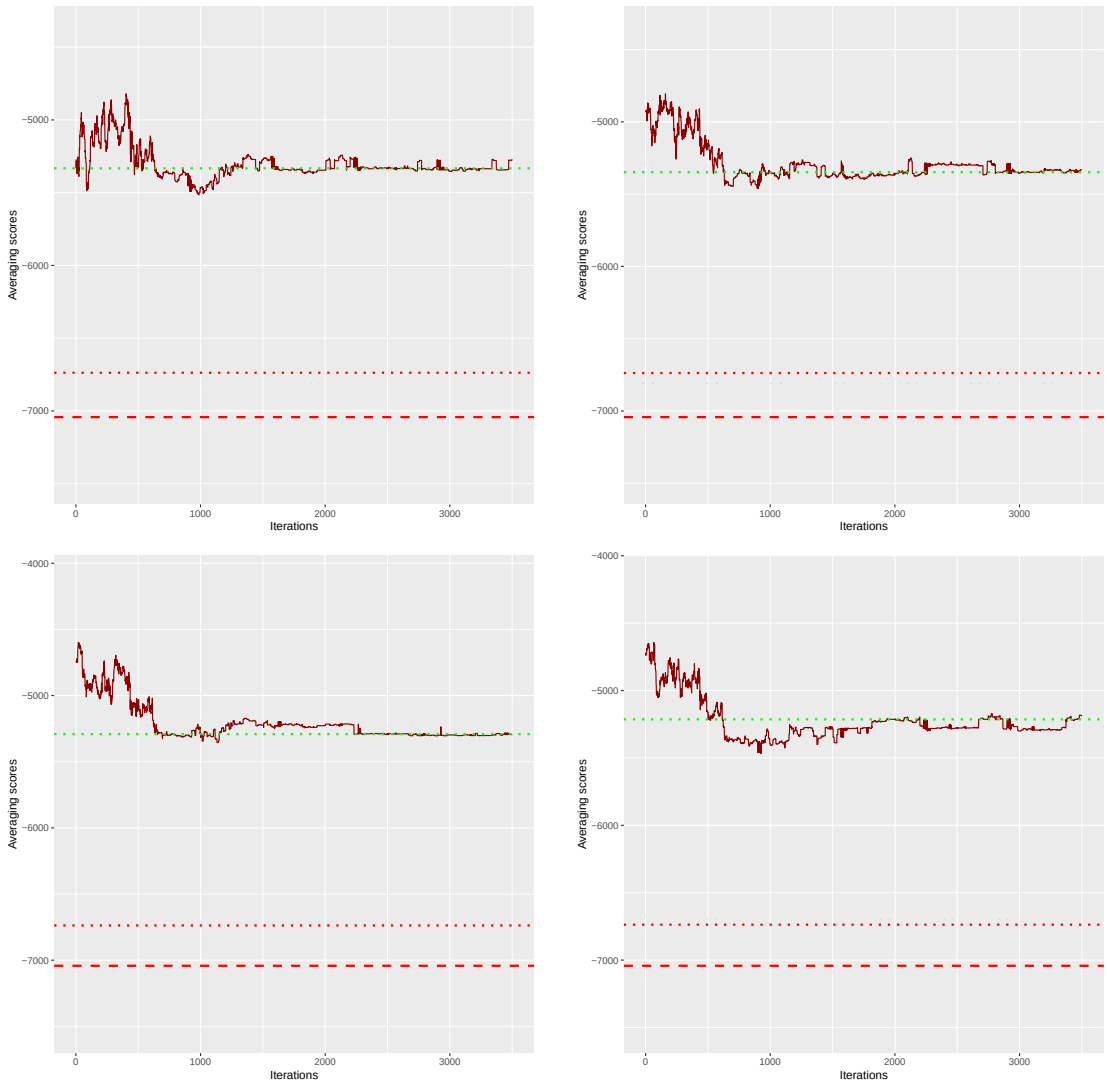

Table 20: Averaging score for variant 2 with **np = 30, 50, 70, 90**

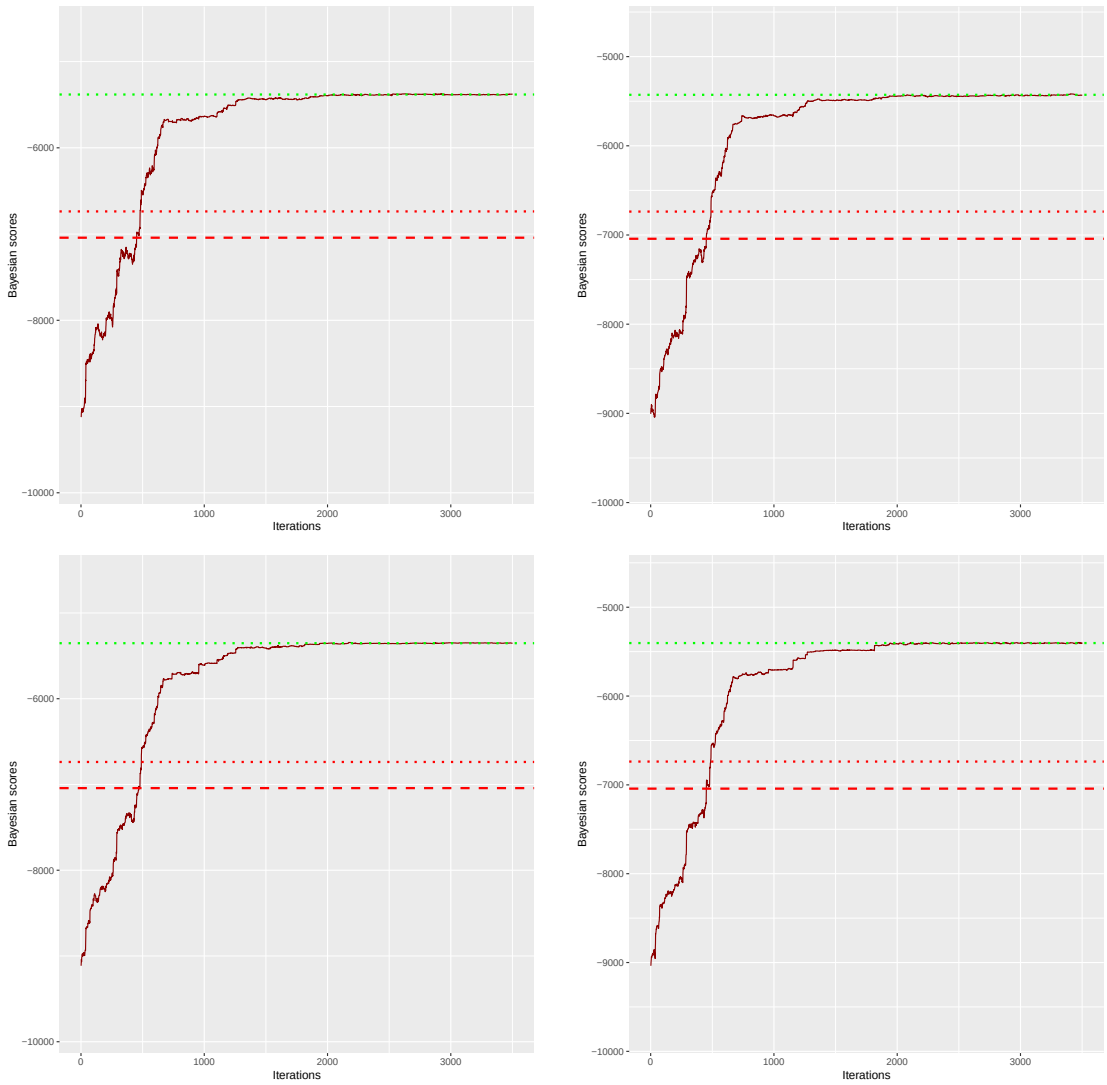

Table 21: Bayesian score for variant 2 with **np = 30, 50, 70, 90**

2.3 Graphics of evolution for variant 3

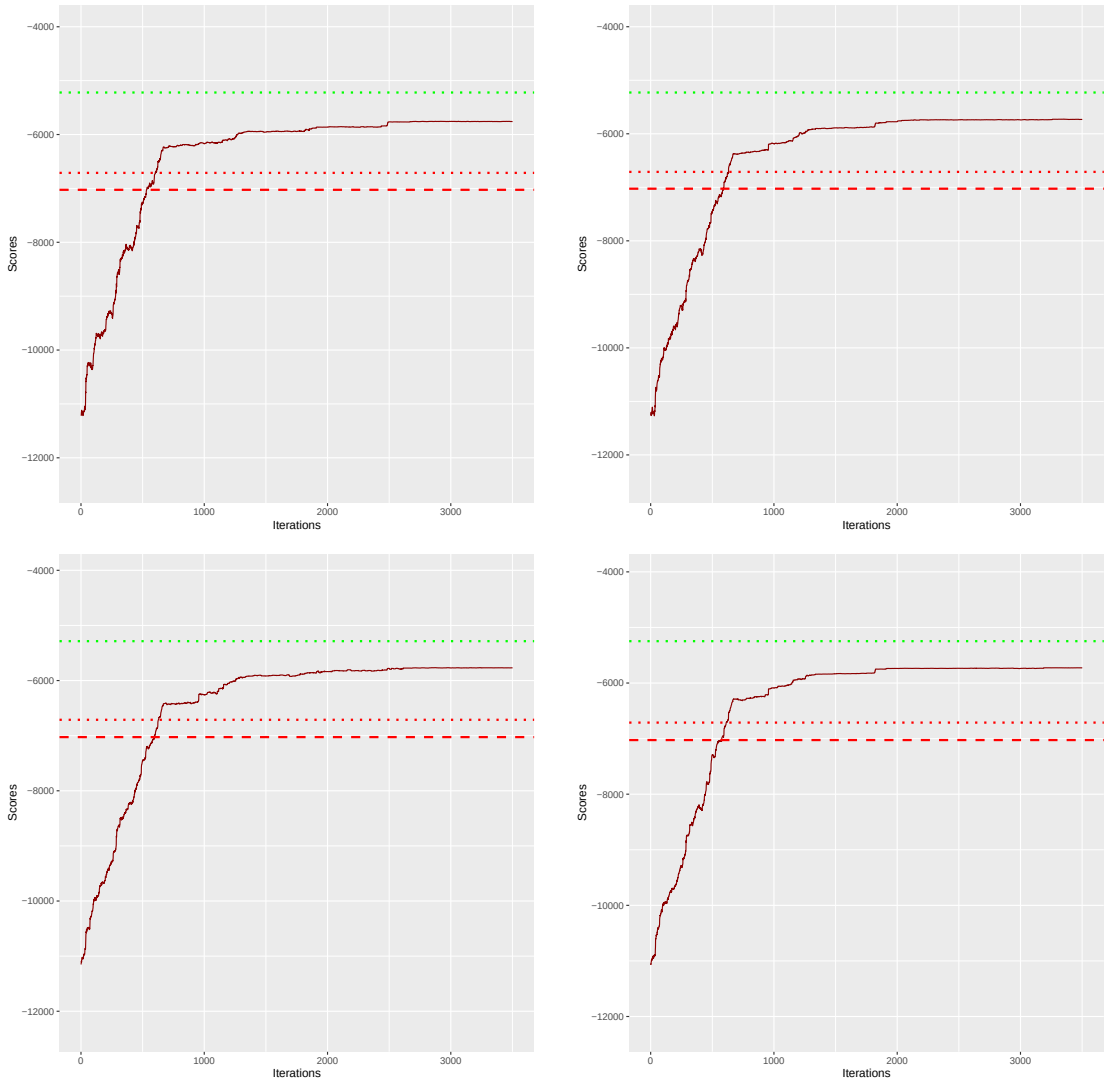

Table 22: Normal score for variant 3 with **np = 30, 50, 70, 90**

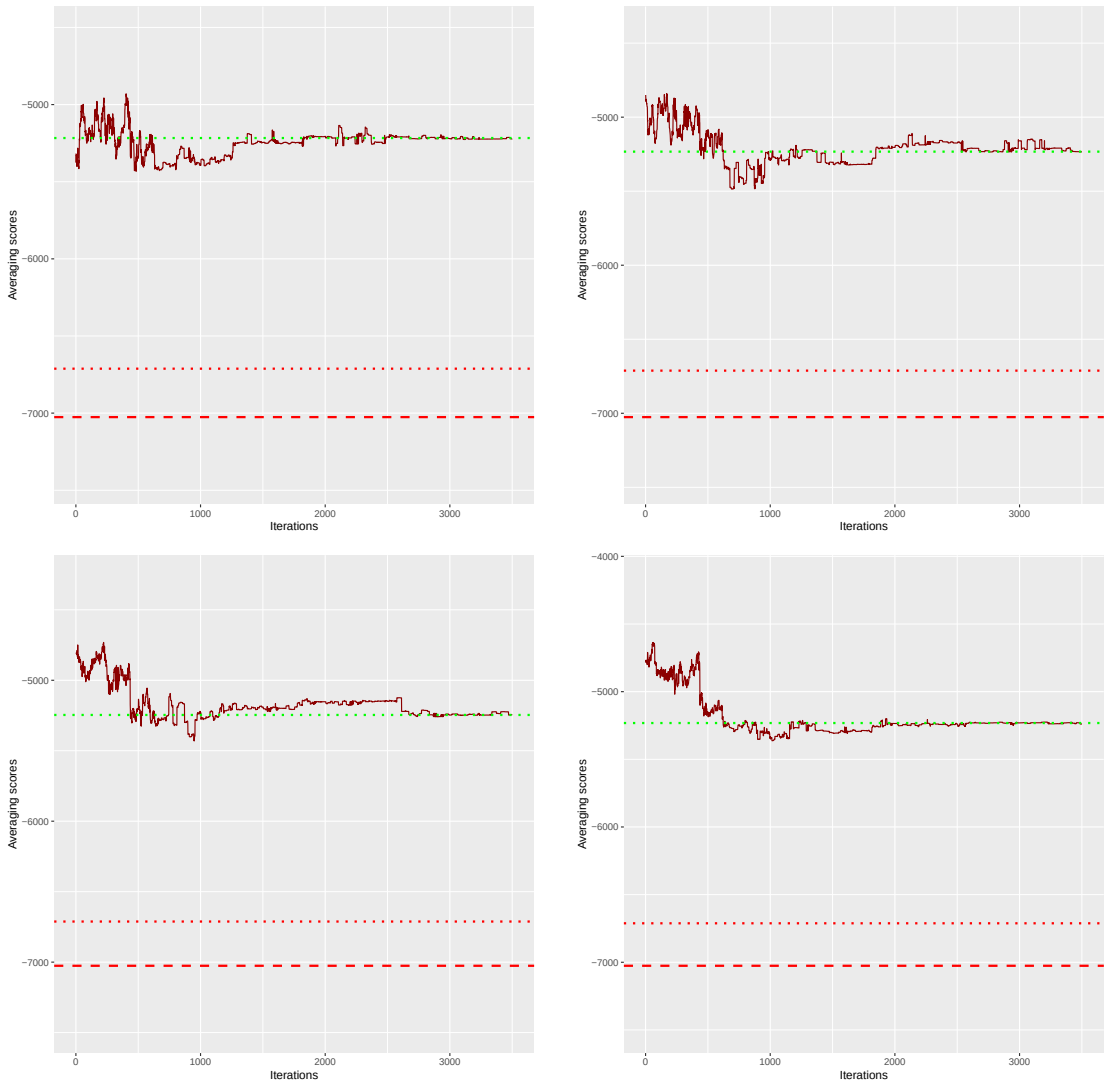

Table 23: Averaging score for variant 3 with **np = 30, 50, 70, 90**

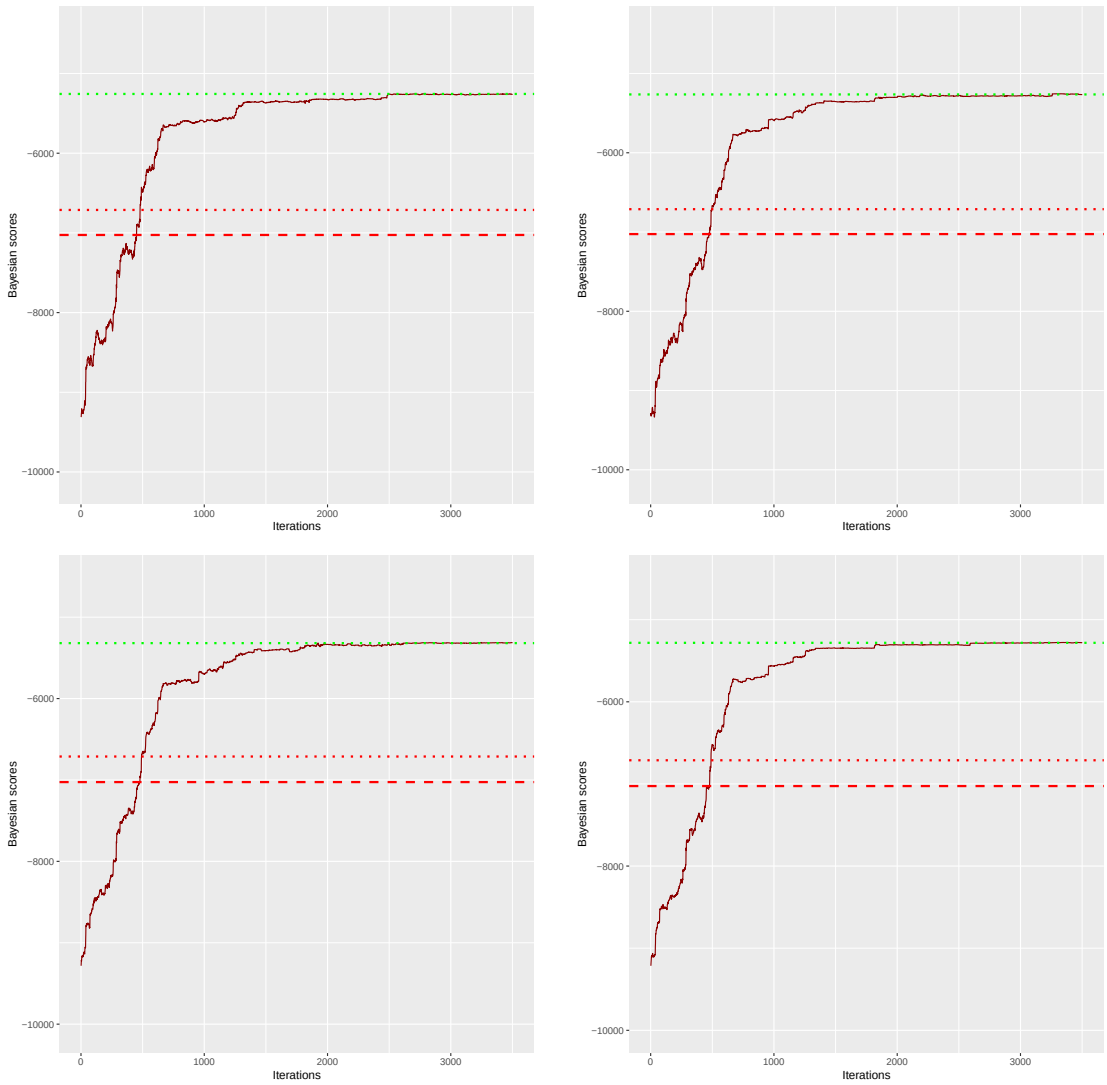

Table 24: Bayesian score for variant 3 with **np = 30, 50, 70, 90**

2.4 Graphics of evolution for variant 4

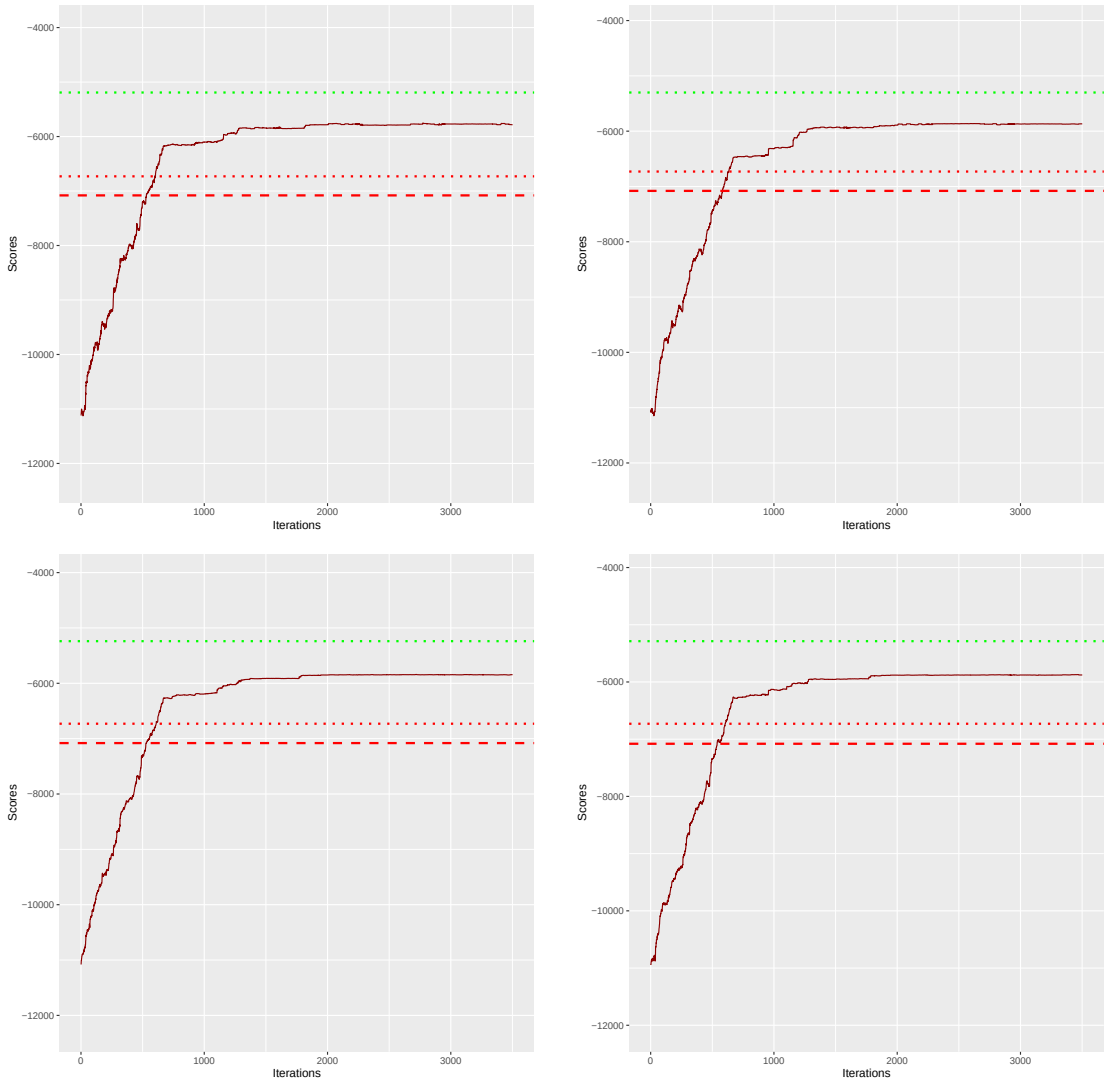

Table 25: Normal score for variant 4 with **np = 30, 50, 70, 90**

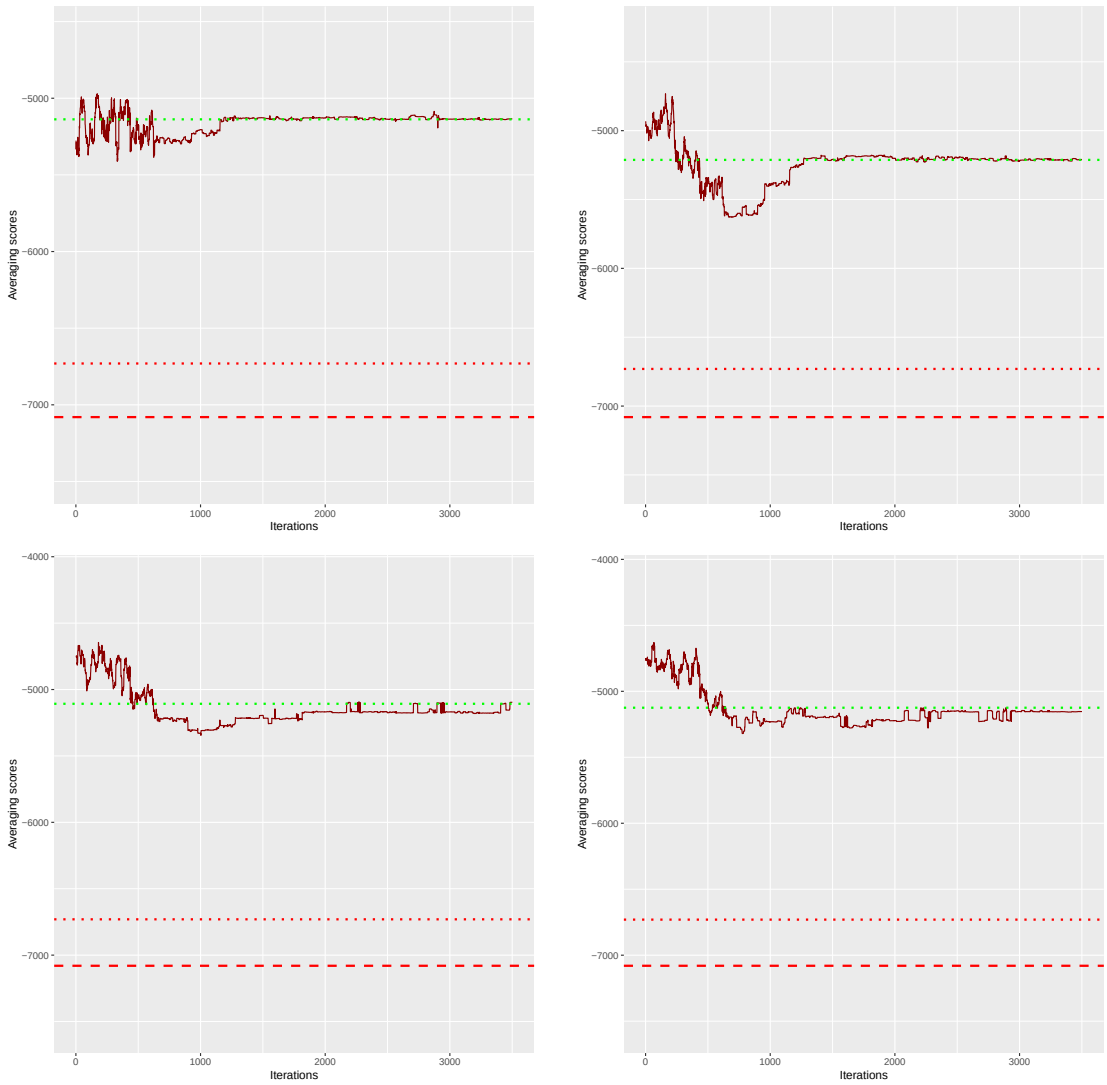

Table 26: Averaging score for variant 4 with **np = 30, 50, 70, 90**

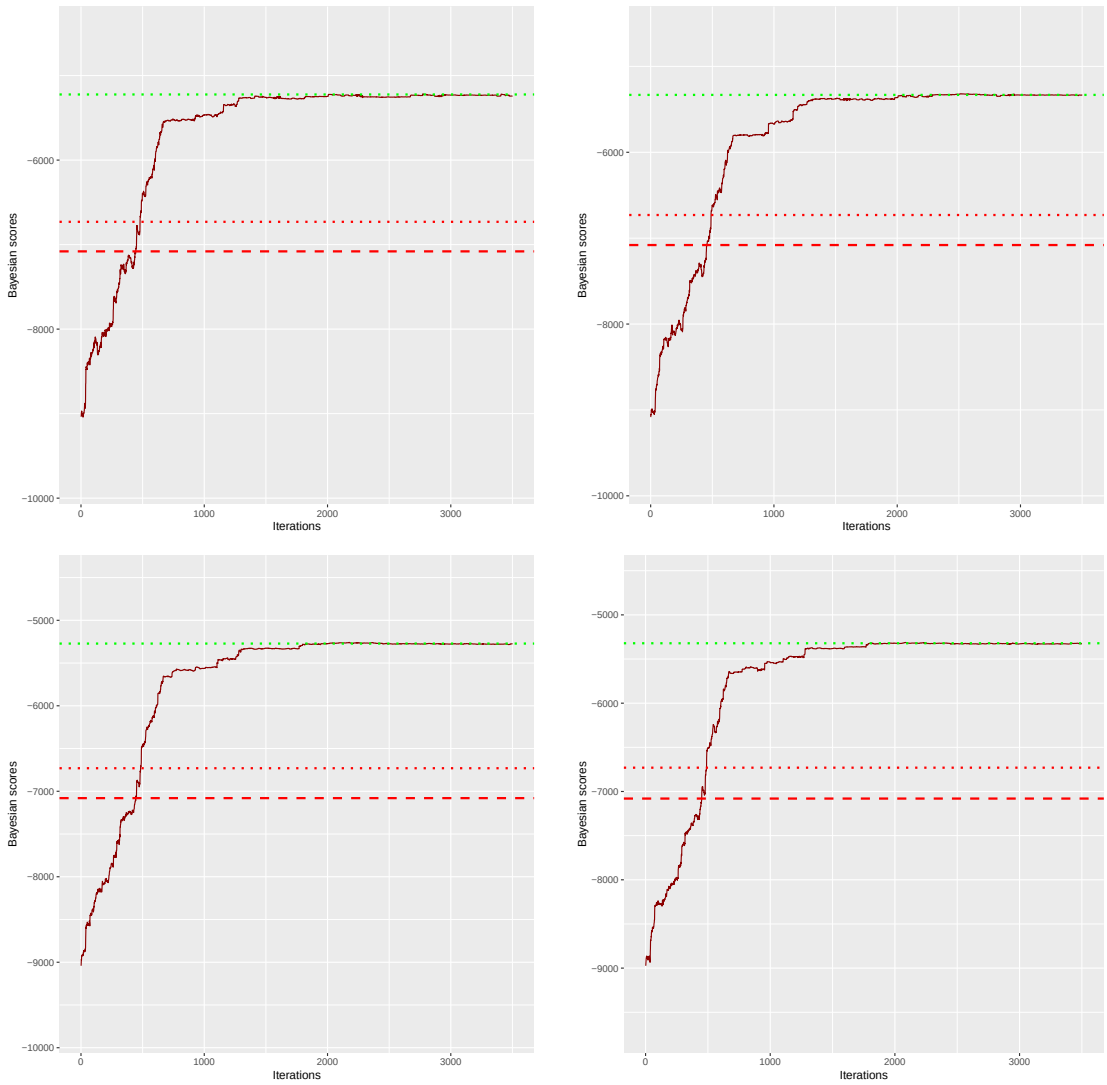

Table 27: Bayesian score for variant 4 with **np = 30, 50, 70, 90**

2.5 Graphics of evolution for variant 5

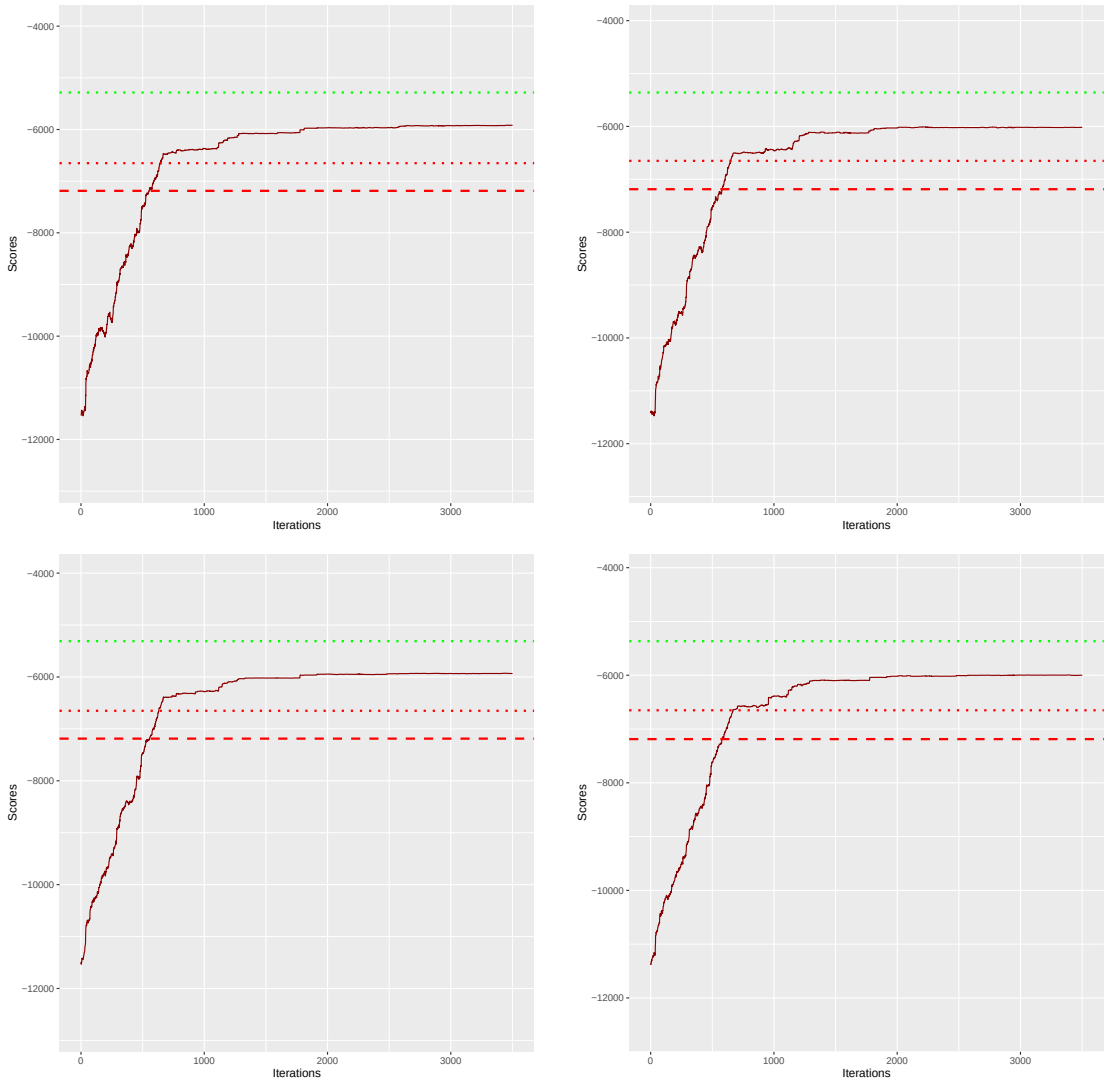

Table 28: Normal score for variant 5 with **np = 30, 50, 70, 90**

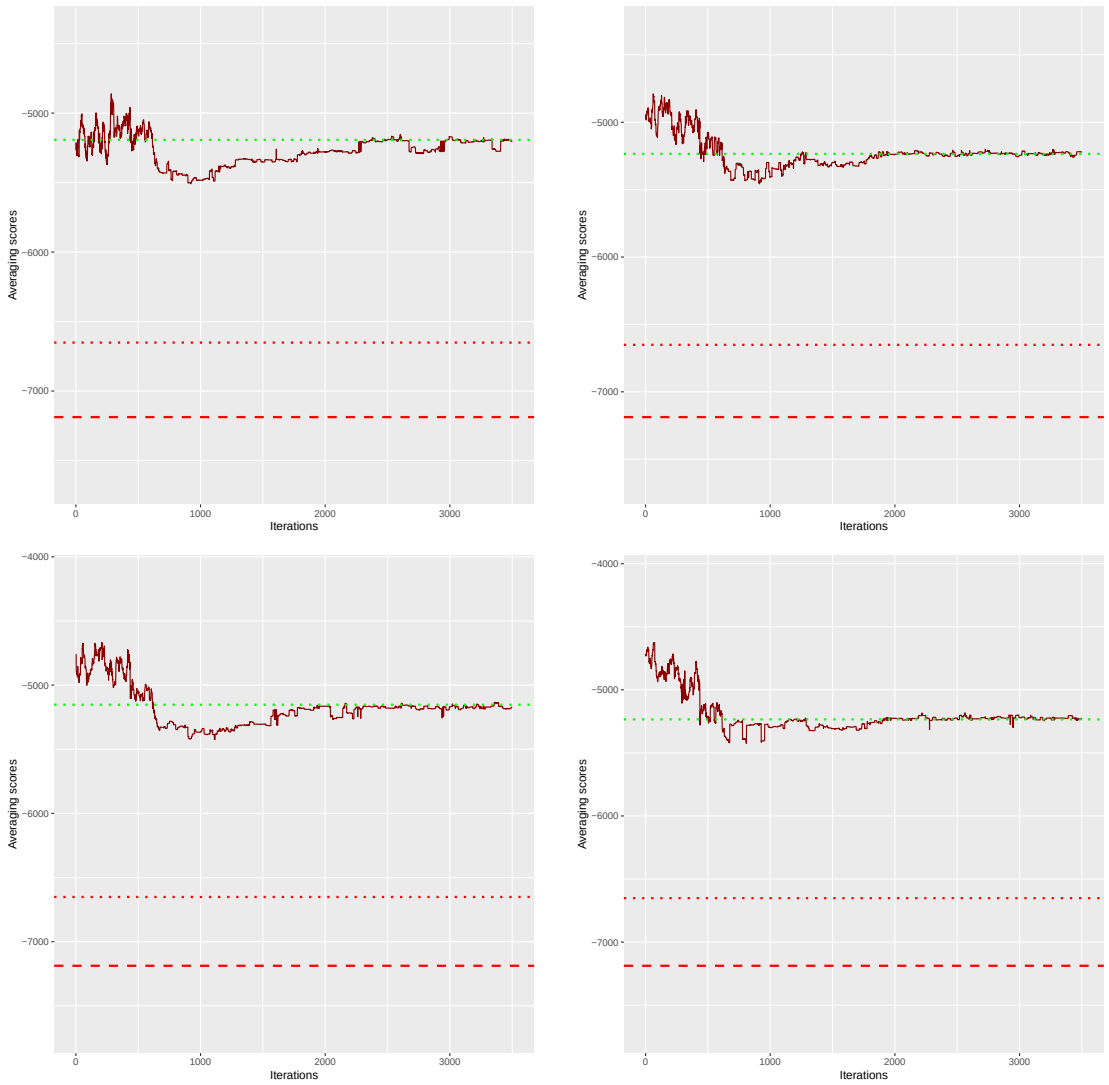

Table 29: Averaging score for variant 5 with **np = 30, 50, 70, 90**

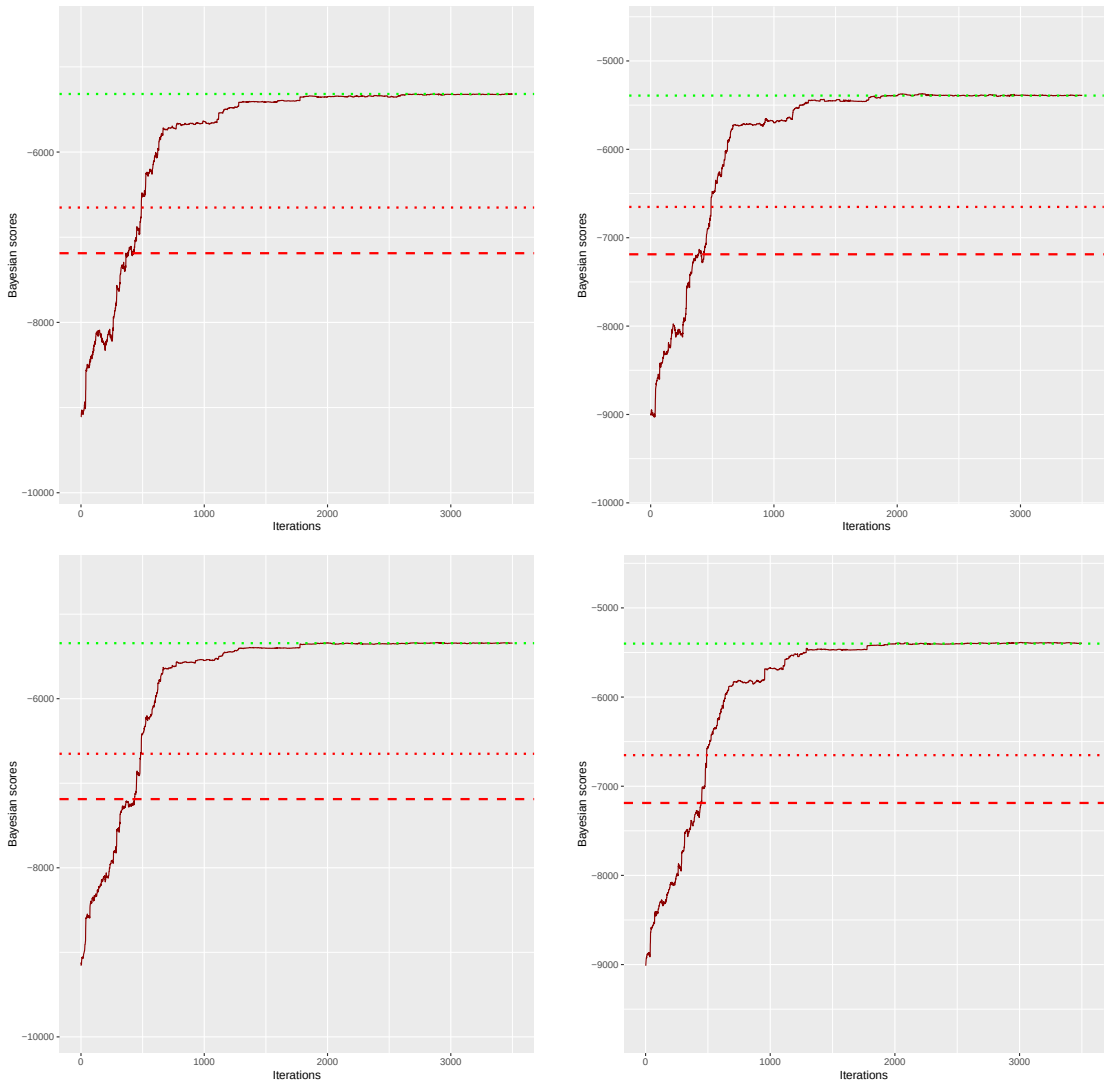

Table 30: Bayesian score for variant 5 with **np = 30, 50, 70, 90**

3 Hepar2

Configuration for **hepar2**:

- number of nodes: 70
- number of arcs: 123
- number of parameters: 1453
- average degree: 3.51
- maximum in-degree: 6
- number of samples of train dataset: 3000
- number of samples of test dataset: 10000
- number of iterations: 10350
- parent sets size: {25, 50, 75, 100}

		V1		V2		V3		V4		V5	
	train	test	train	test	train	test	train	test	train	test	
bnlearn		-97973	-98139	-98361	-98190	-98506	-98115	-98079	-98117	-98614	-98113
	normal	-97650	-97692	-97968	-97727	- 98232	- 97793	-97607	-97648	-98258	-97864
np = 25	avg		-997572		-97317		-97150		-97554		-96691
	bay		-97779		-97812		-97879		- 97736		- 97594
	normal	-97705	-97800	-98054	-97794	-98097	-97704	-97839	-97858	-98276	-97697
np = 50	avg		-97597		-97740		-97494		-97795		-97463
	bay		-97891		-97882		-97784		- 97947		-97779
	normal	-97662	-97718	-97998	-97741	-98177	-97776	-97715	-97720	-98319	-97764
np = 75	avg		-97426		-97109		-97483		-97460		-97515
	bay		-97804		-97828		-97860		-97806		-97849
	normal	-97723	-97789	-98046	-97775	-98199	-97815	-97652	-97657	-98233	-97790
np = 100	avg		-97581		-97503		-97297		-97186		-97540
	bay		-97876		-97860		-97897		-97742		-97875

3.1 Graphics of evolution for variant 1

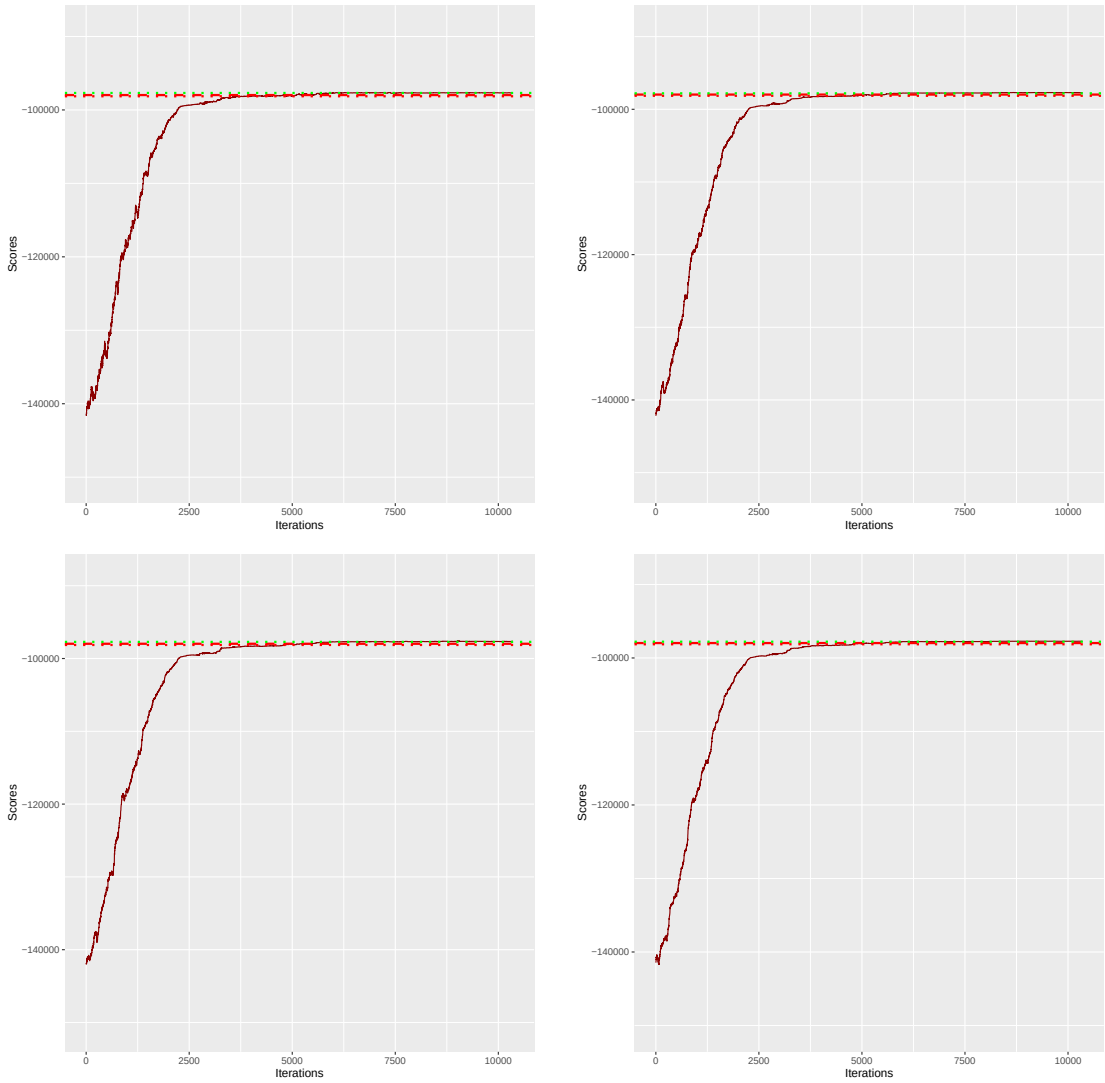

Table 31: Normal score for variant 1 with **np = 25, 50, 75, 100**

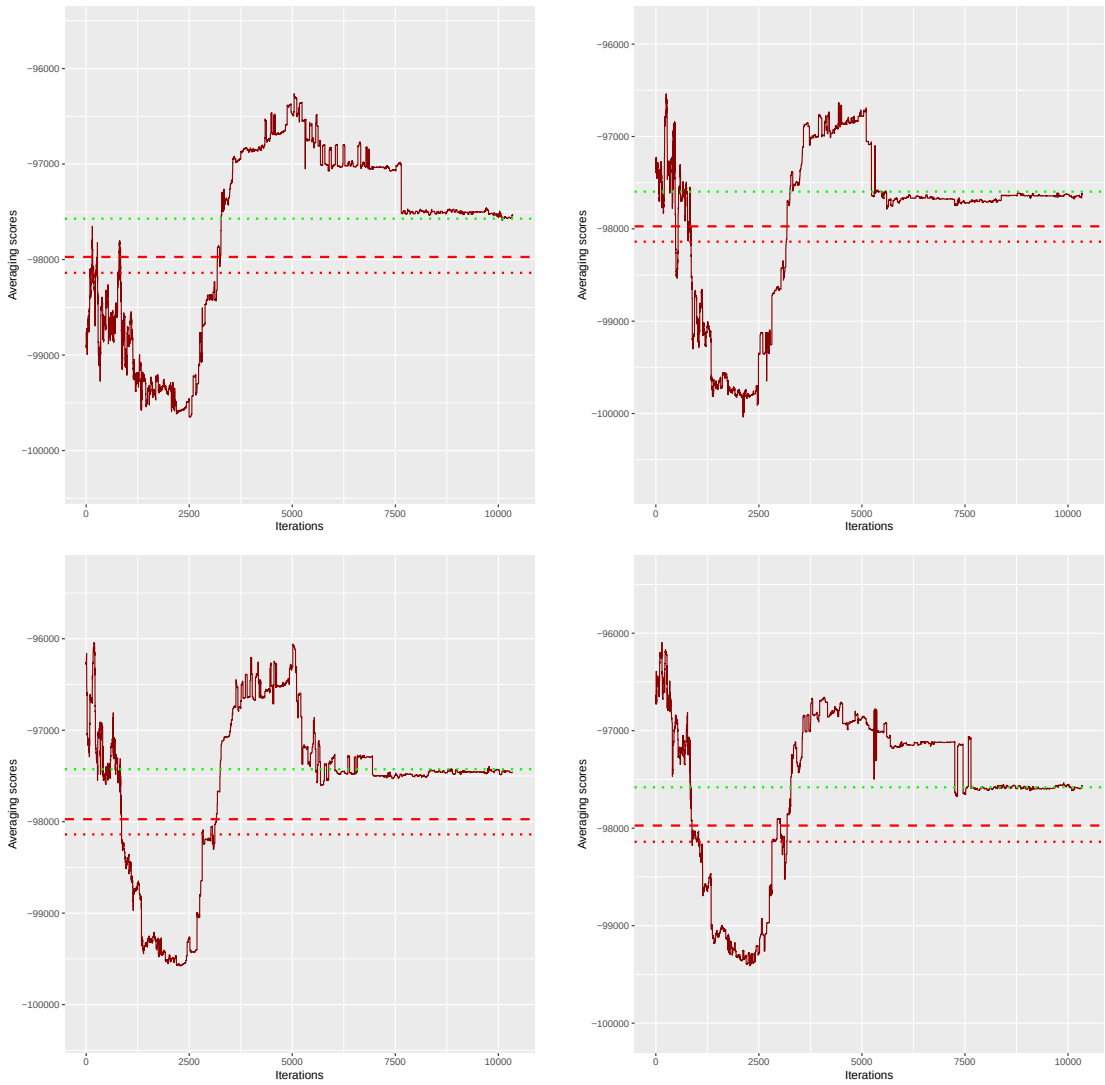

Table 32: Averaging score for variant 1 with **np = 25, 50, 75, 100**

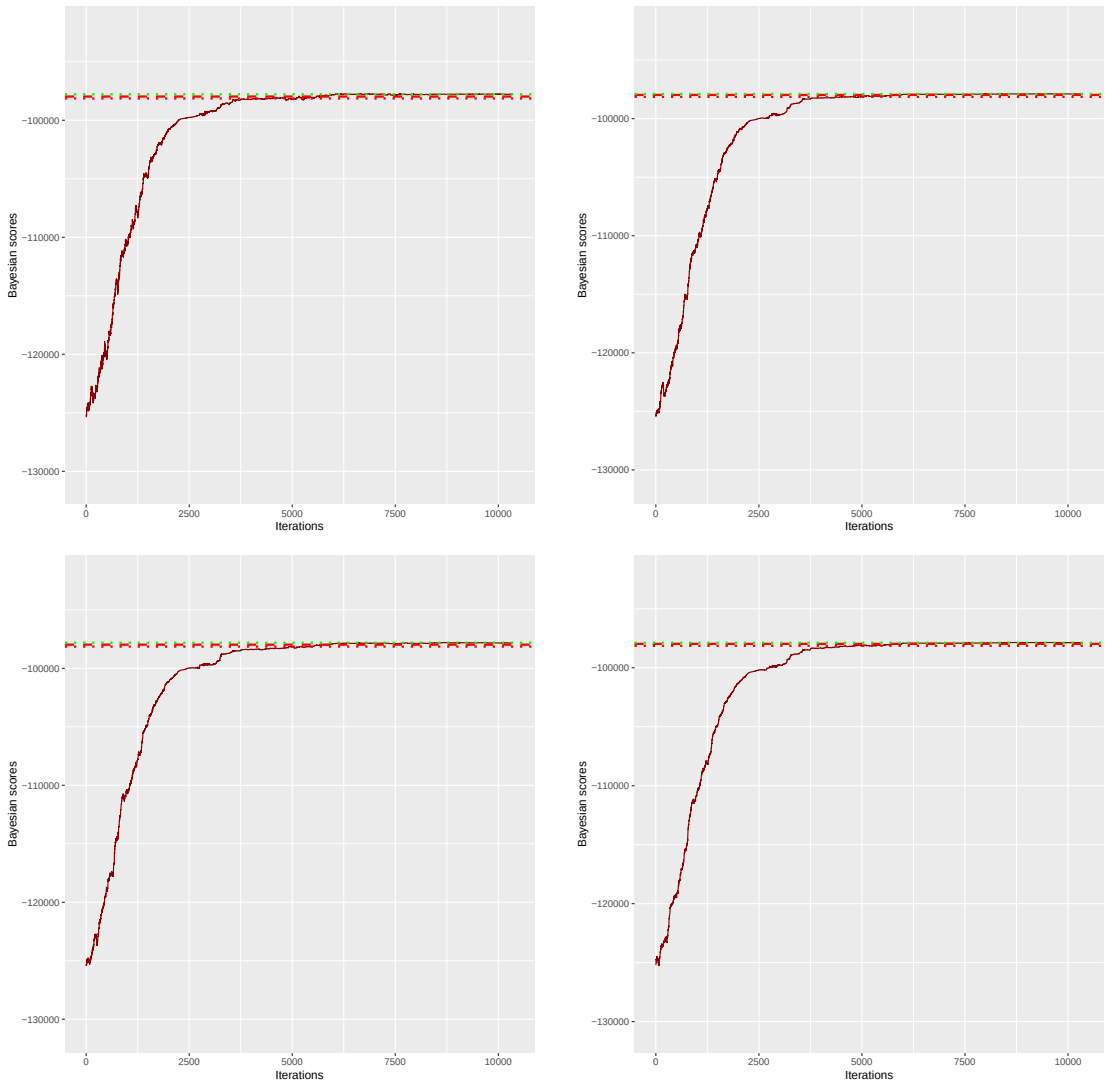

Table 33: Bayesian score for variant 1 with **np = 25, 50, 75, 100**

3.2 Graphics of evolution for variant 2

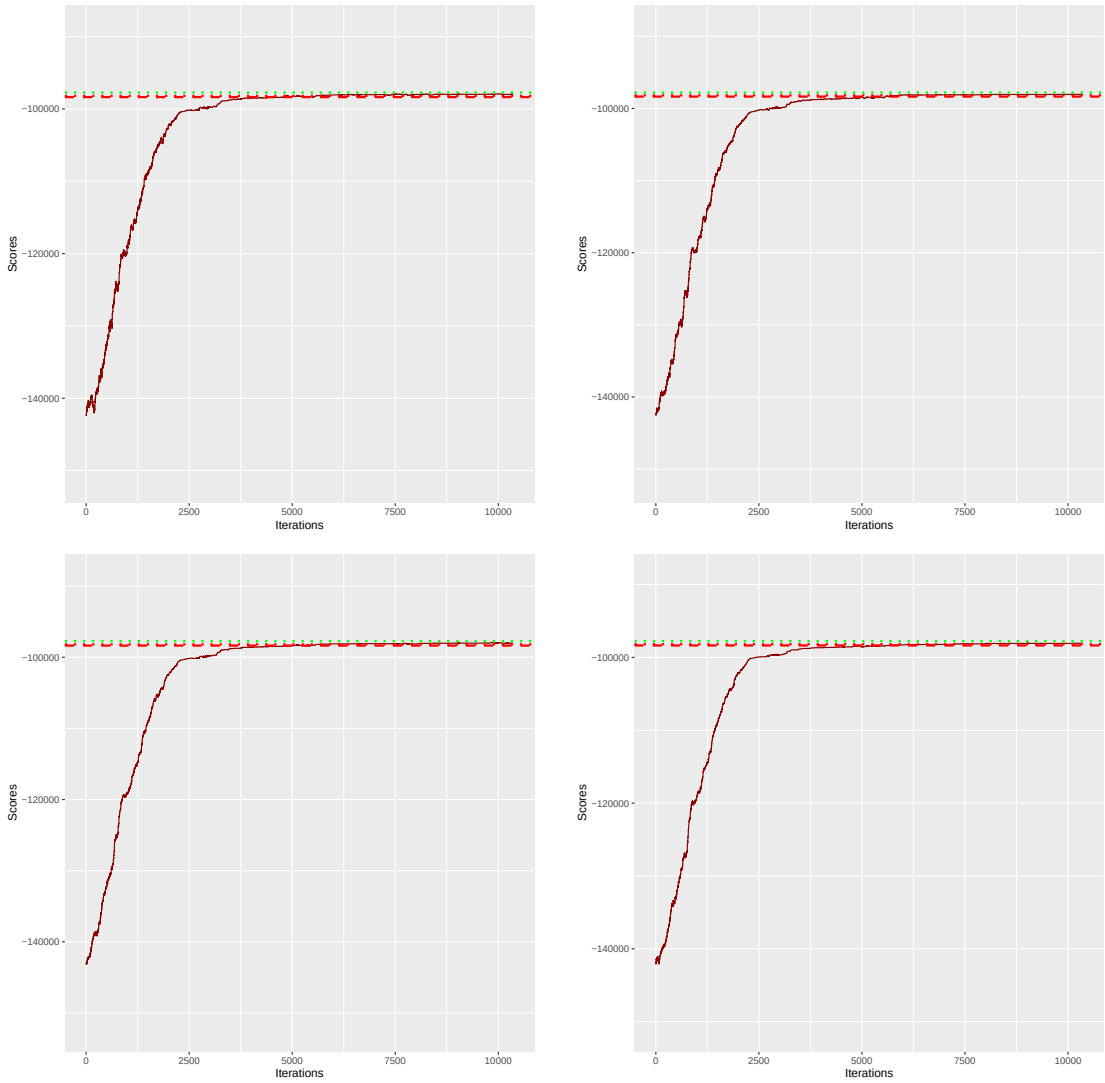

Table 34: Normal score for variant 2 with **np = 25, 50, 75, 100**

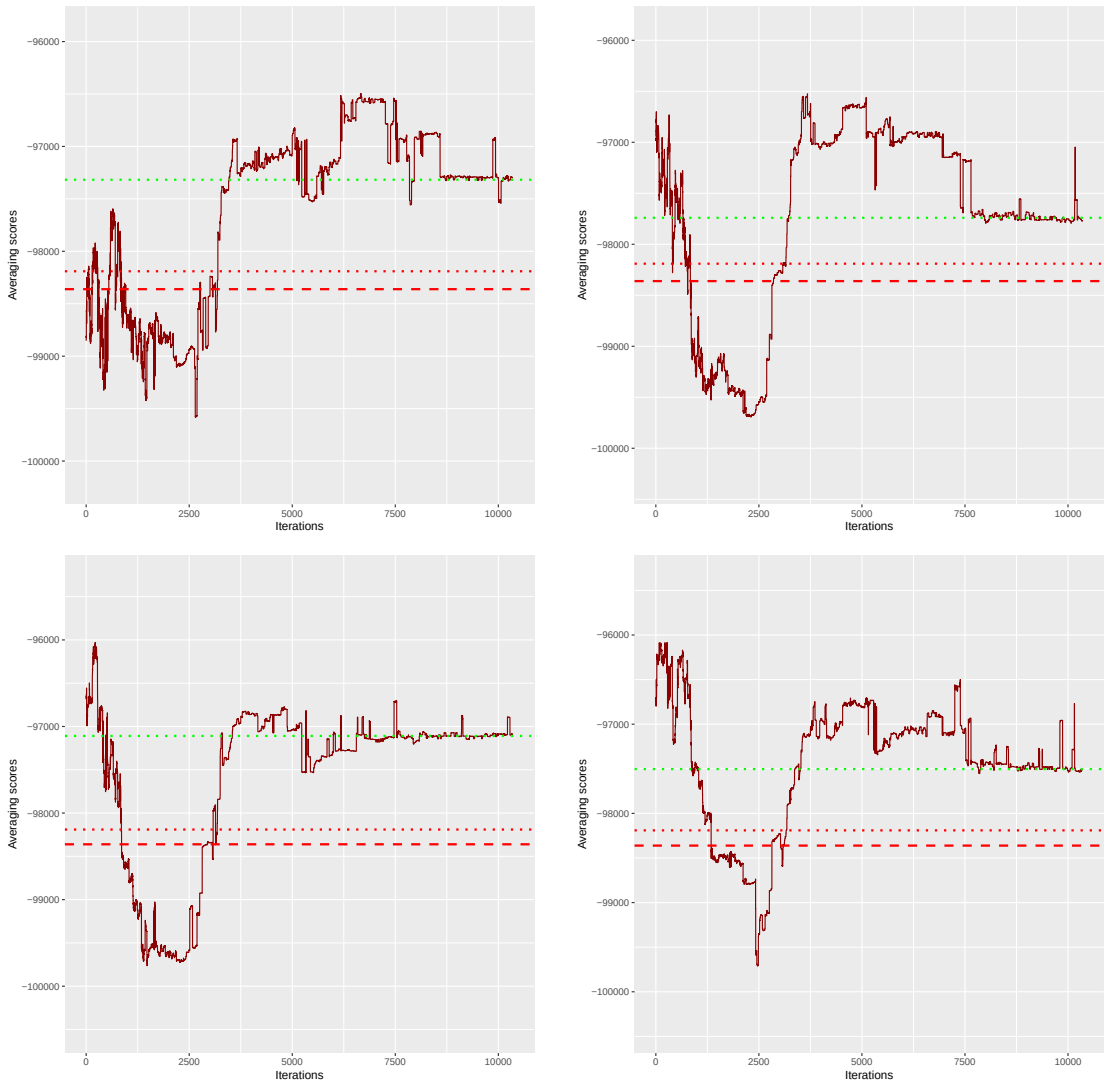

Table 35: Averaging score for variant 2 with **np = 25, 50, 75, 100**

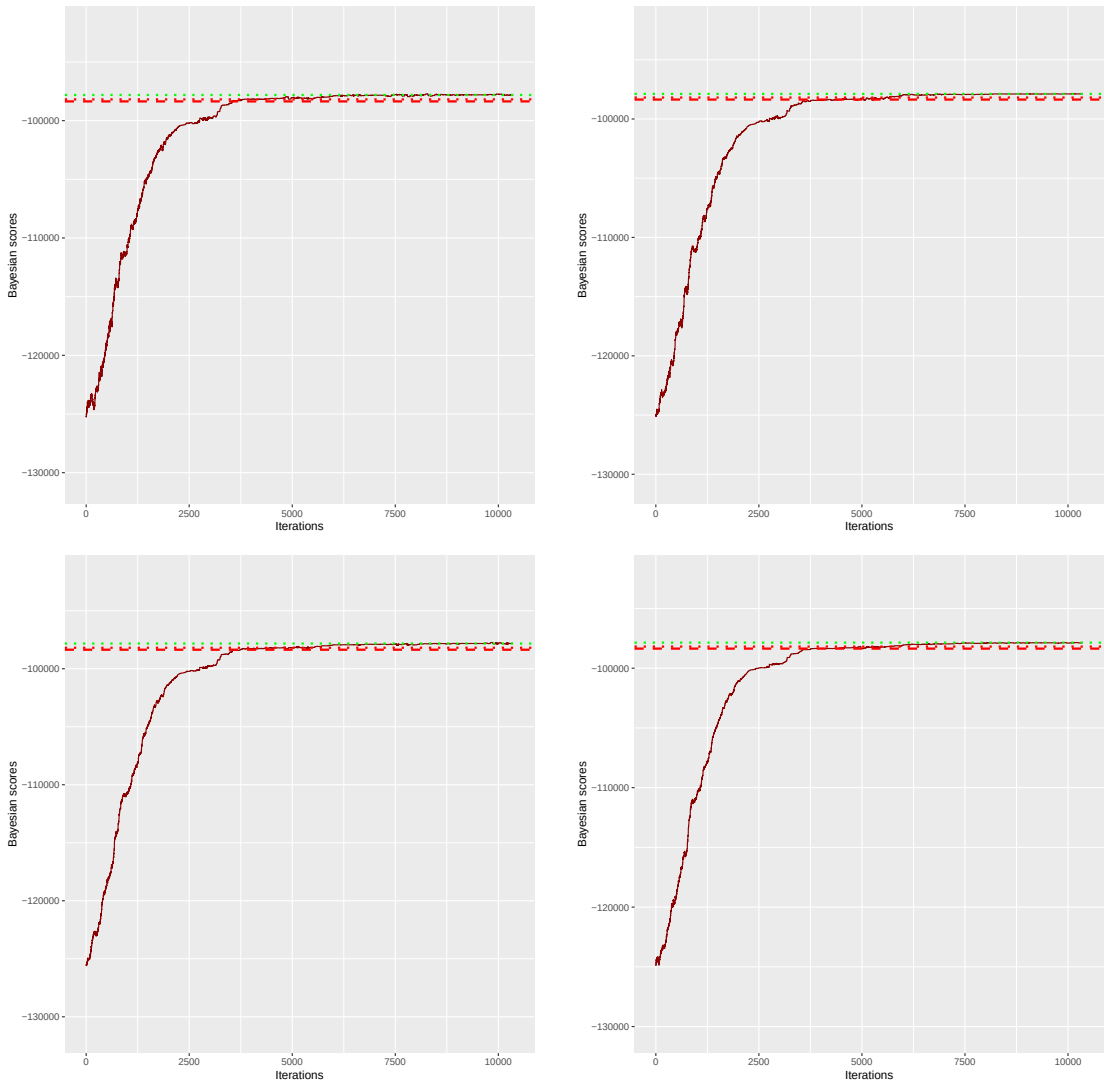

Table 36: Bayesian score for variant 2 with **np = 25, 50, 75, 100**

3.3 Graphics of evolution for variant 3

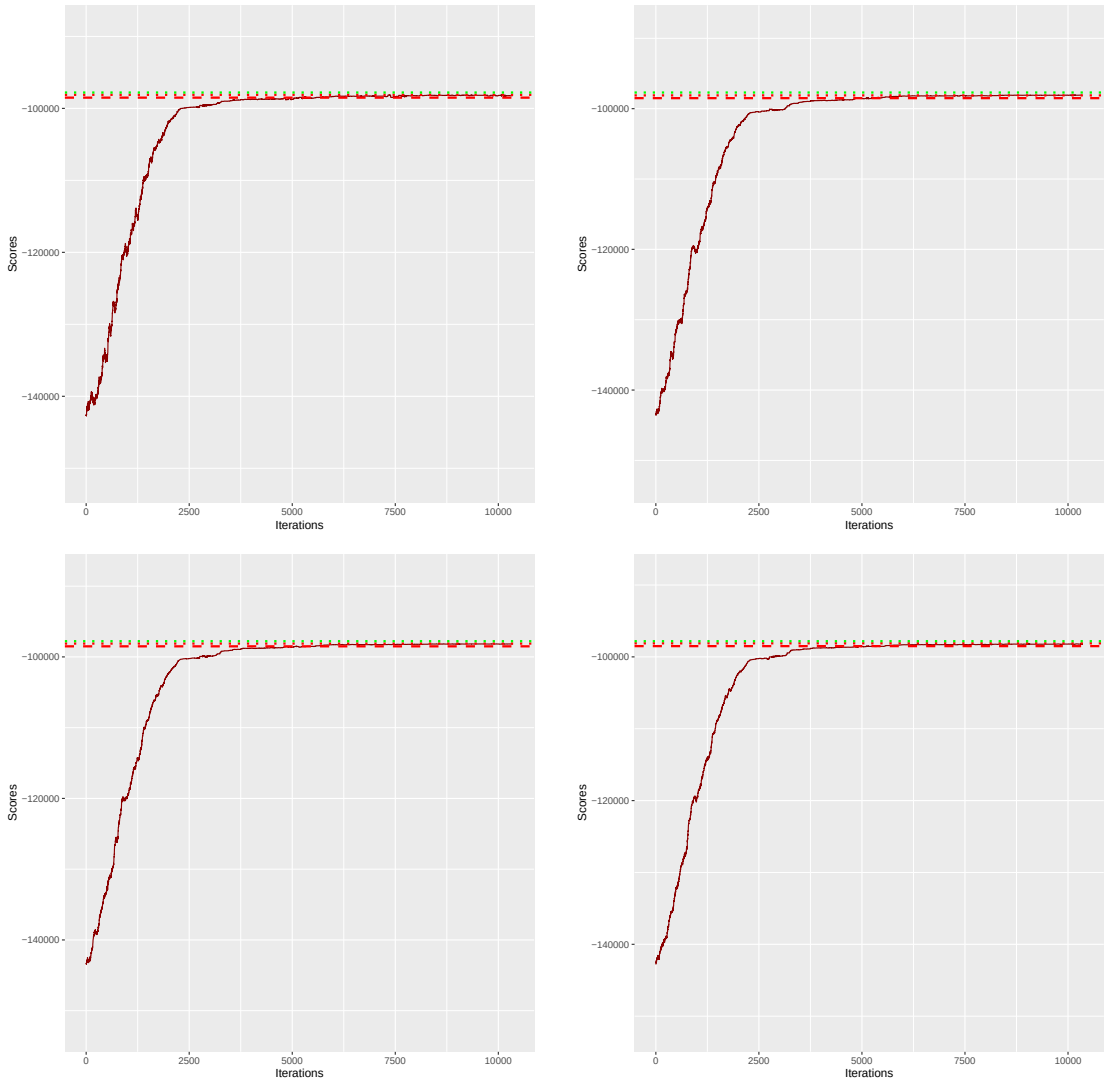

Table 37: Normal score for variant 3 with **np = 25, 50, 75, 100**

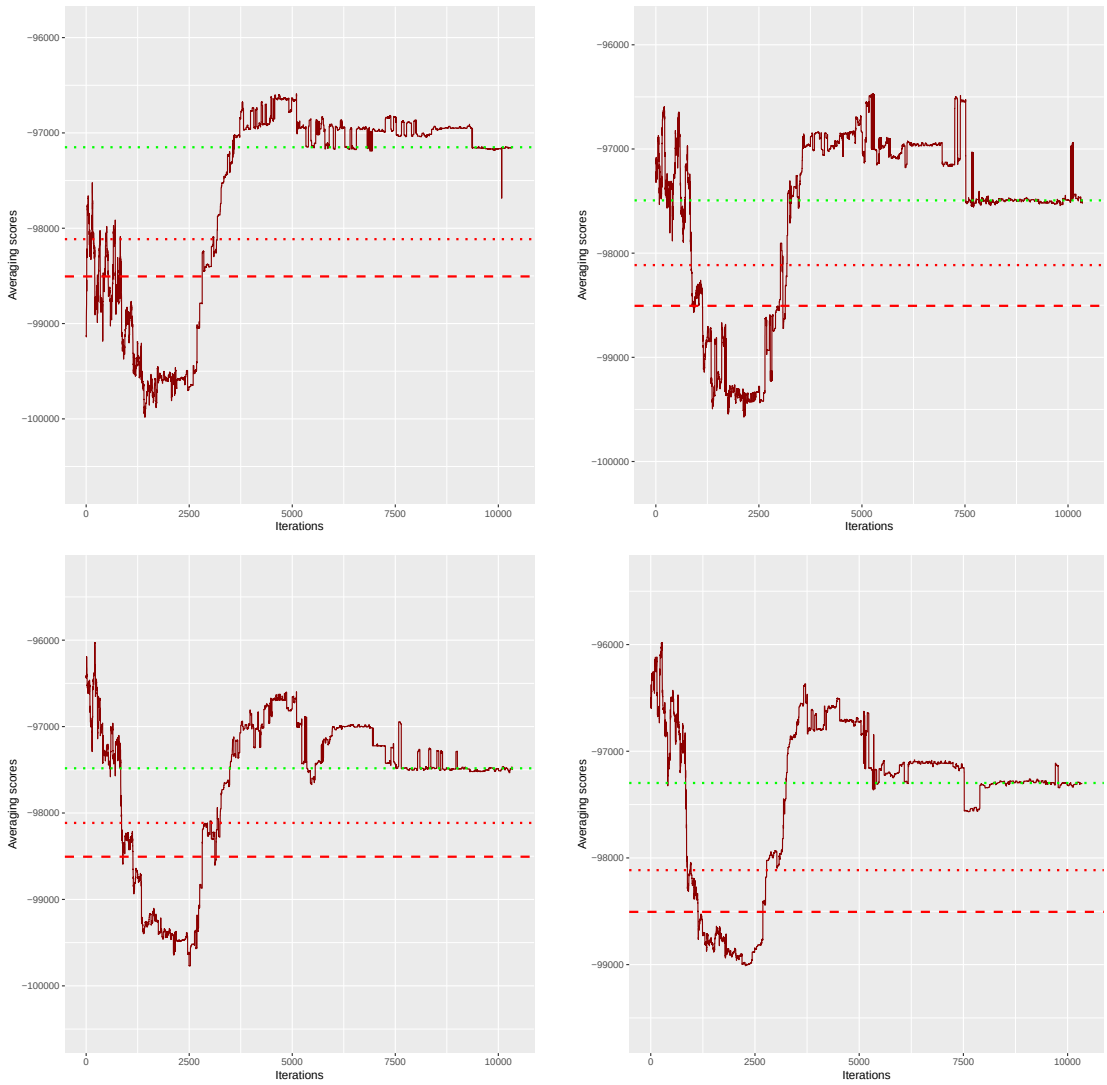

Table 38: Averaging score for variant 3 with **np = 25, 50, 75, 100**

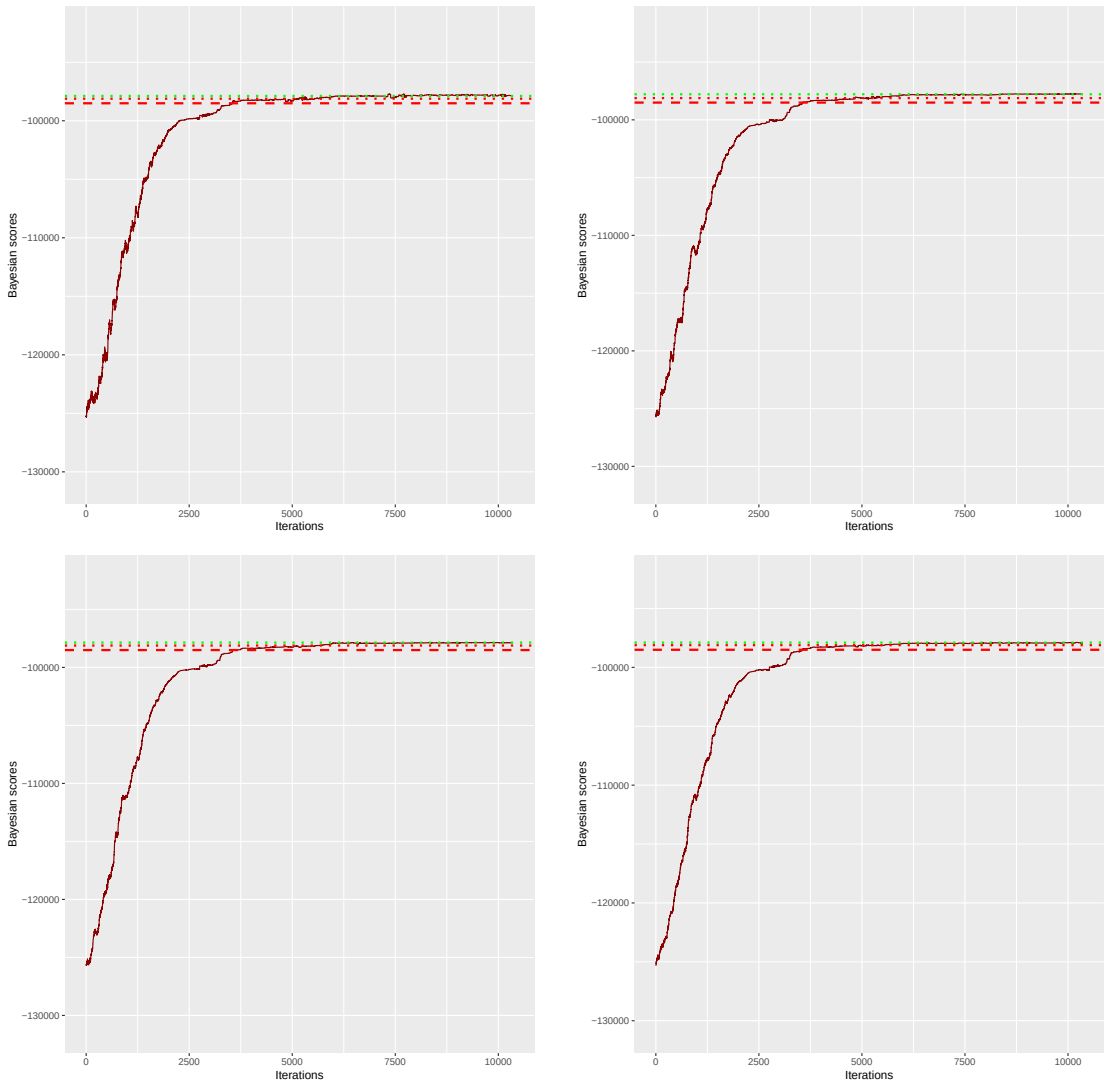

Table 39: Bayesian score for variant 3 with **np = 25, 50, 75, 100**

3.4 Graphics of evolution for variant 4

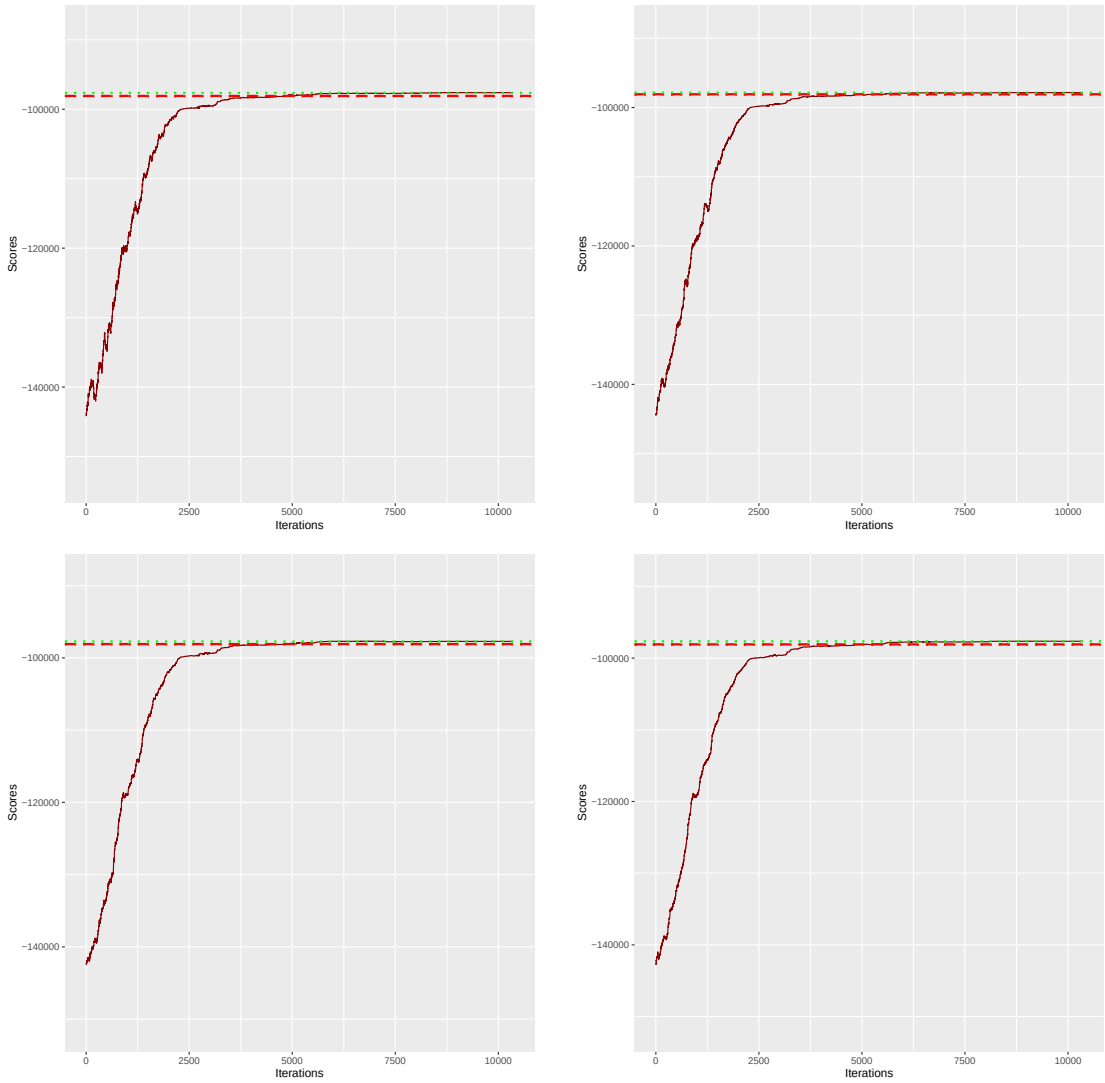

Table 40: Normal score for variant 4 with **np = 25, 50, 75, 100**

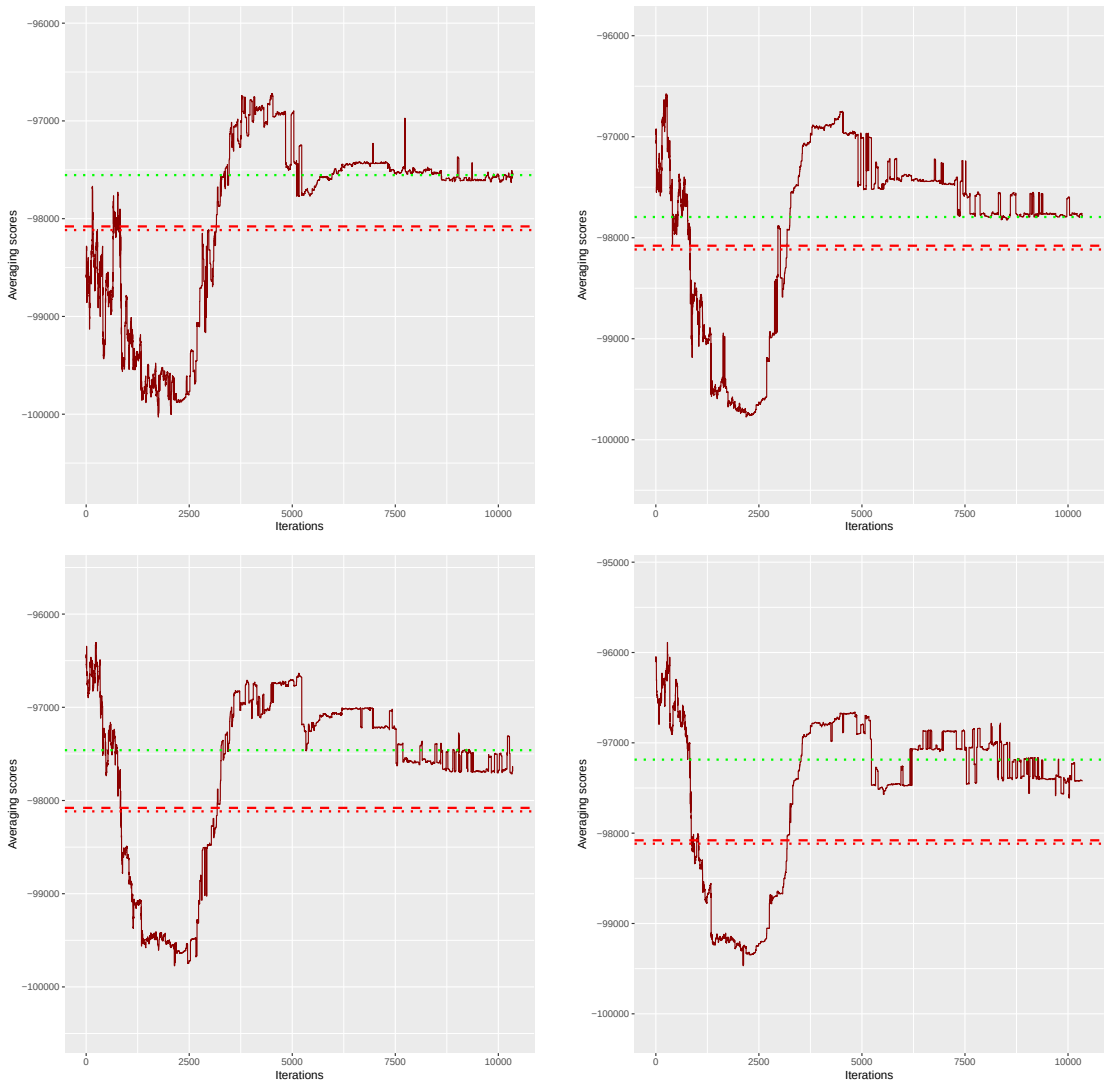

Table 41: Averaging score for variant 4 with **np = 25, 50, 75, 100**

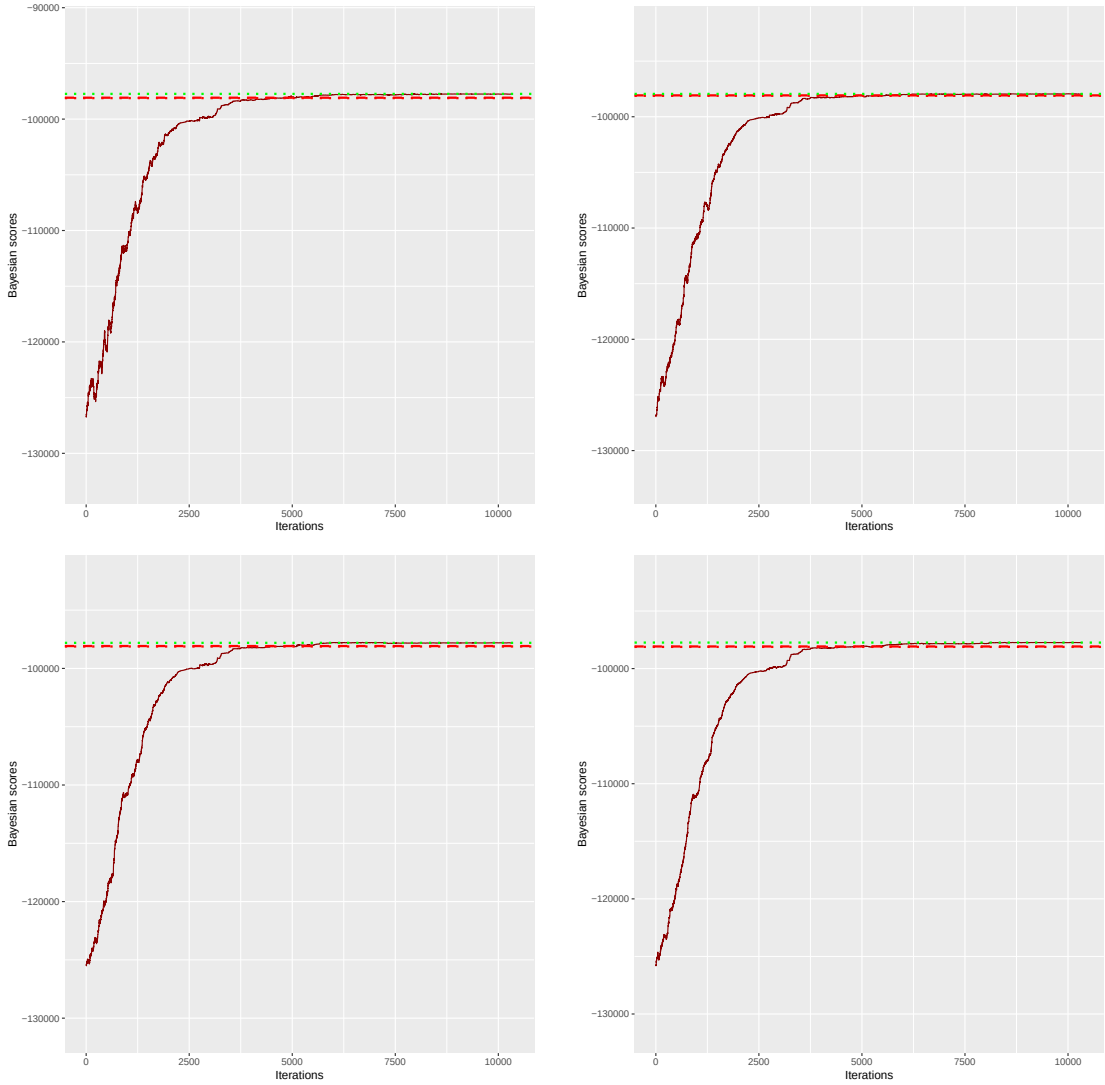

Table 42: Bayesian score for variant 4 with **np = 25, 50, 75, 100**

3.5 Graphics of evolution for variant 5

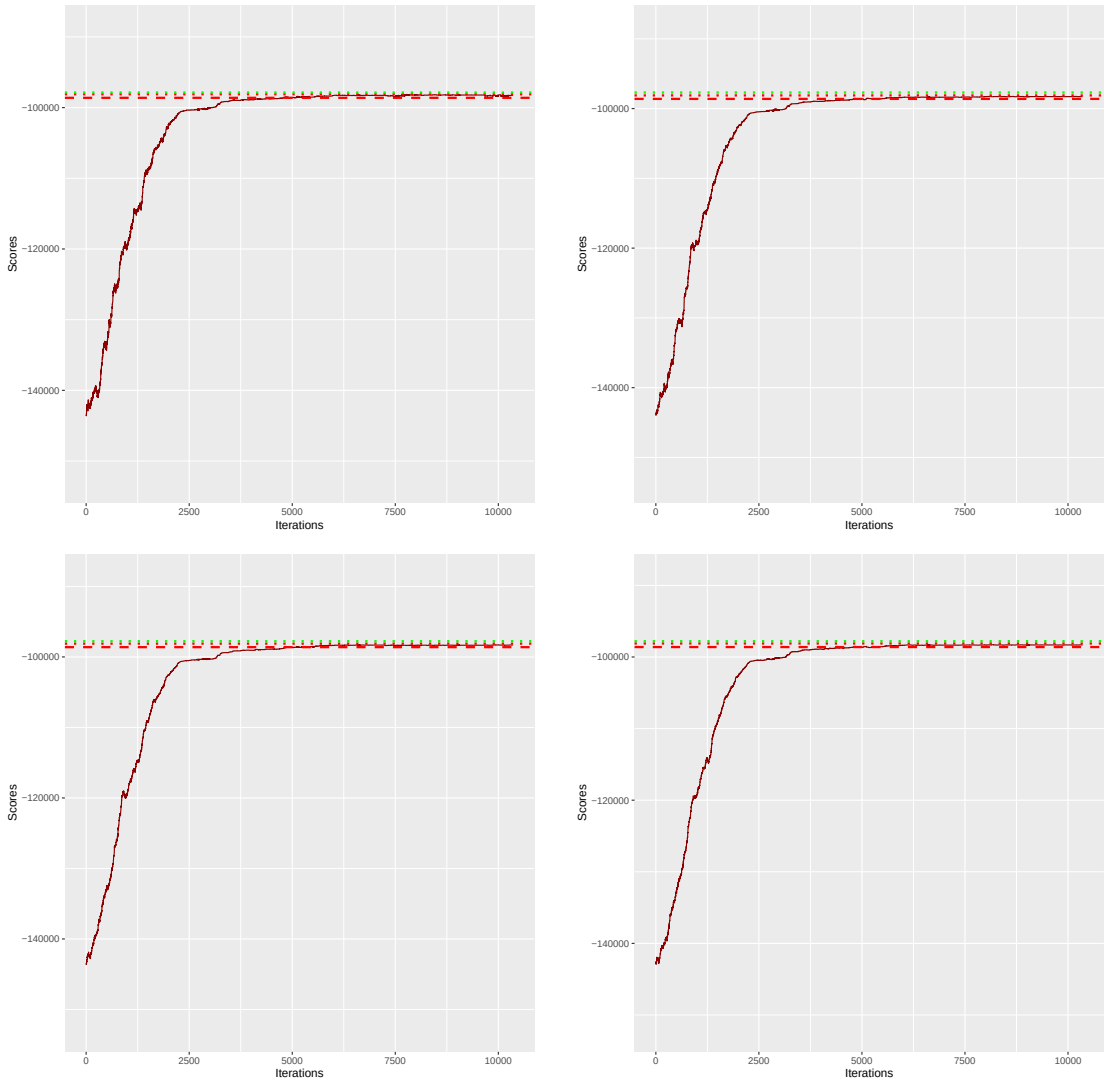

Table 43: Normal score for variant 5 with **np = 25, 50, 75, 100**

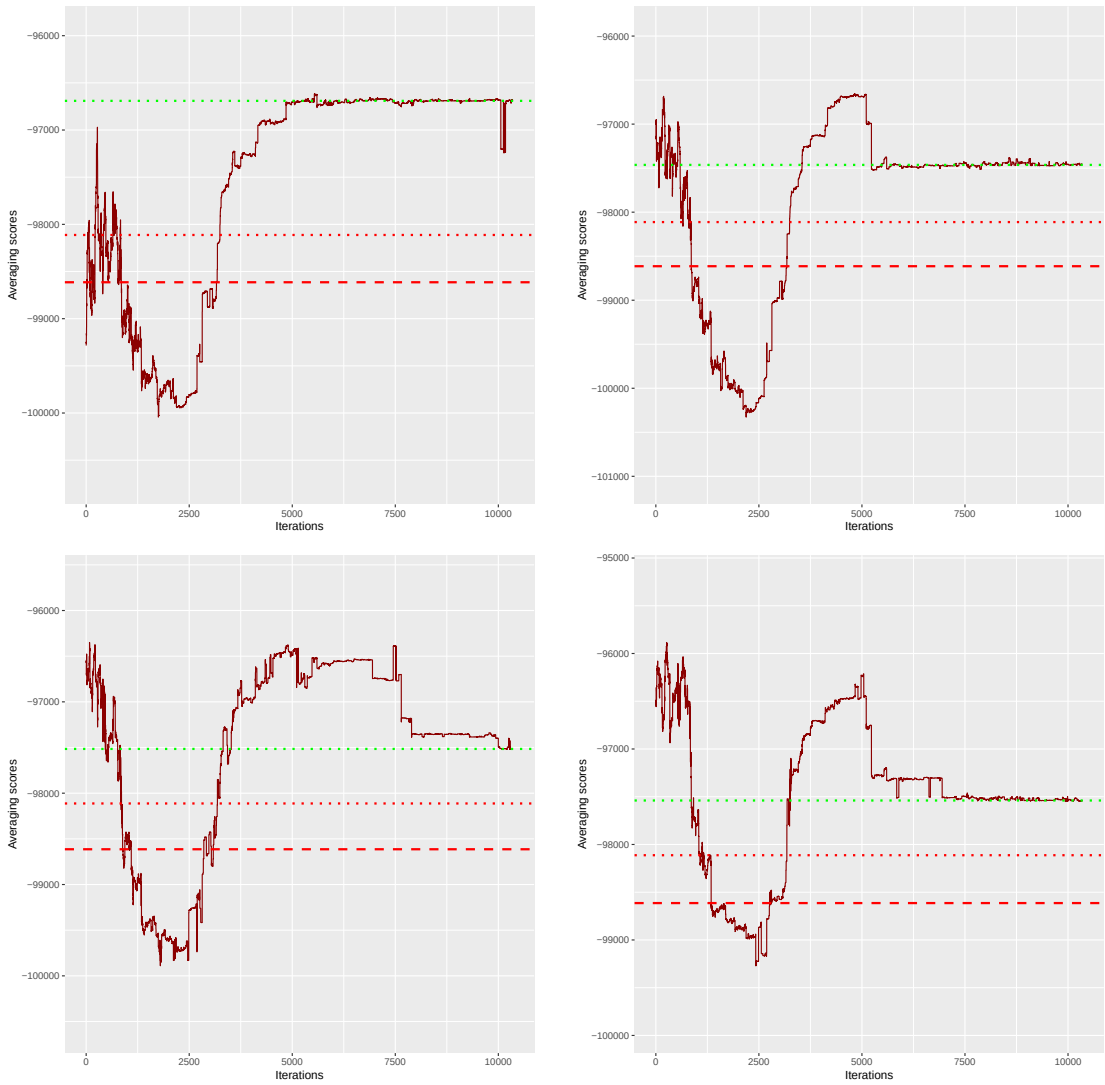

Table 44: Averaging score for variant 5 with **np = 25, 50, 75, 100**

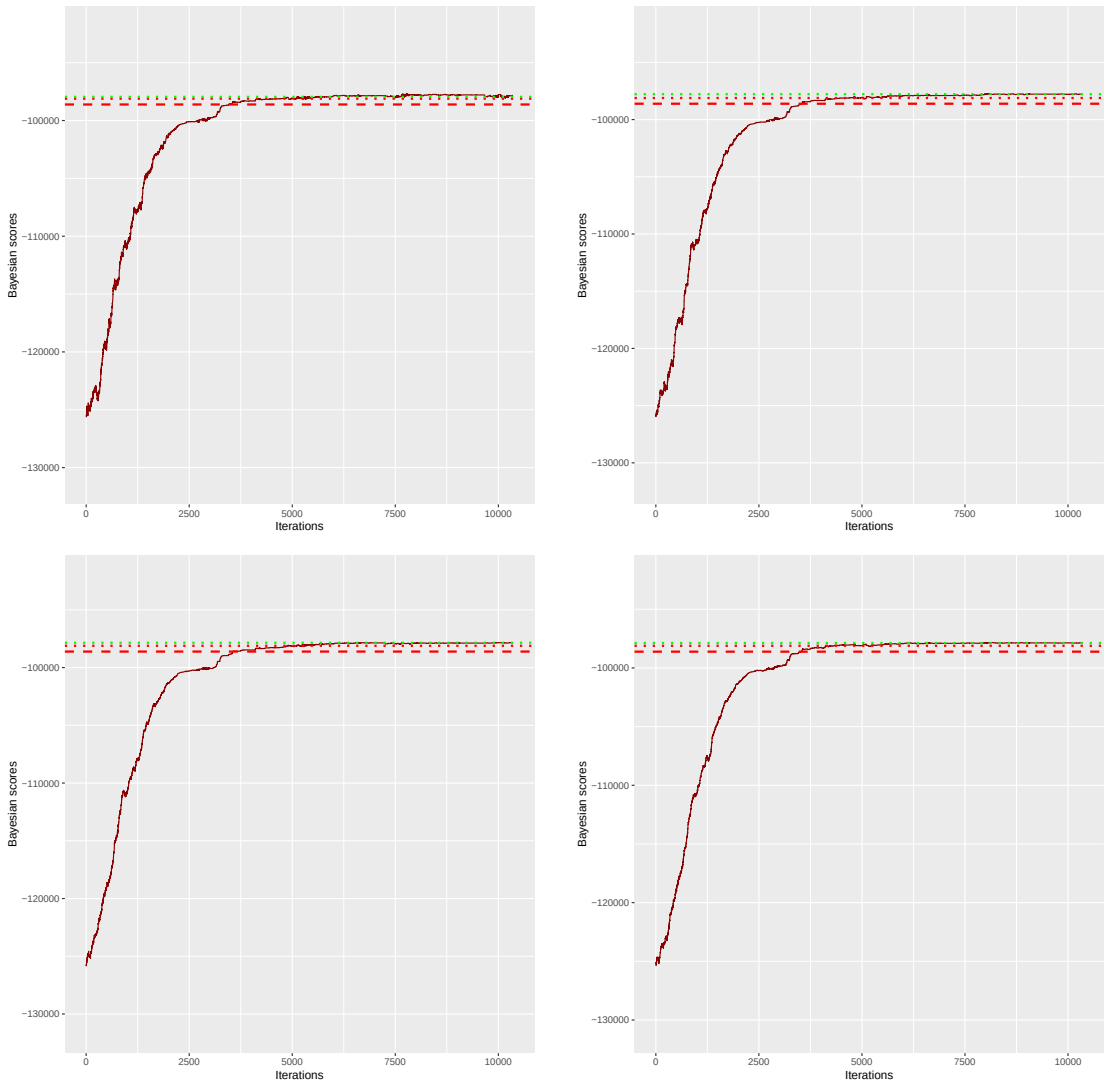

Table 45: Bayesian score for variant 5 with **np = 25, 50, 75, 100**

4 Win95pts

Configuration for **win95pts**:

- number of nodes: 76
- number of arcs: 112
- number of parameters: 574
- average degree: 2.95
- maximum in-degree: 7
- number of samples of train dataset: 2500
- number of samples of test dataset: 10000
- number of iterations: 14250
- parent sets size: {25, 50, 75, 100}

		V1		V2		V3		V4		V5	
	train	test	train	test	train	test	train	test	train	test	
bnlearn		-23322	-23398	-23413	-23240	-23371	-23498	-23570	-23390	-23506	-23570
np = 25	normal	-16501	-16125	-16470	-15197	-16276	-15889	-16493	-16047	-16489	-15994
	avg		-16340		-16175		-16052		-16243		-16263
	bay		-16595		-16374		-16333		-16466		-15465
np = 50	normal	-16366	-15950	-16472	-15970	-16421	-16038	-16491	-15926	-16497	-16006
	avg		-16118		-16065		-16296		-16126		-16177
	bay		-16419		-16416		-16477		-16337		-16491
np = 75	normal	-16309	-16008	-16481	-15921	-16317	-15963	-16437	-15802	-16519	-16006
	avg		-16129		-16120		-16167		-16005		-16223
	bay		-16484		-16370		-16401		-16219		-16498
np = 100	normal	-16310	-16004	-16433	-15852	-16363	-16023	-16733	-16152	-16516	-16051
	avg		-16088		-16144		-16246		-16342		-16212
	bay		-16479		-16301		-16461		-16581		-16538

4.1 Graphics of evolution for variant 1

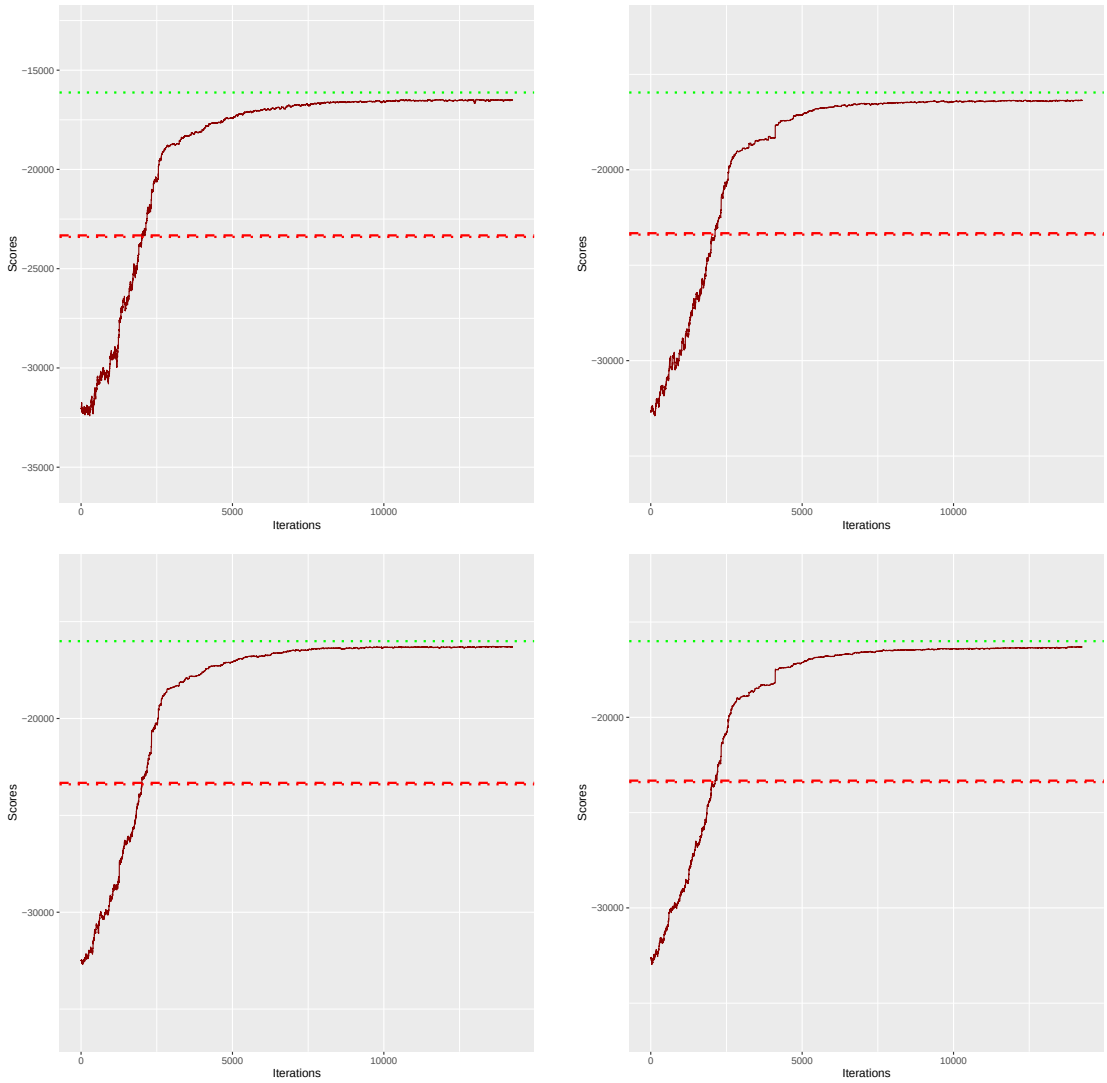

Table 46: Normal score for variant 1 with **np = 25, 50, 75, 100**

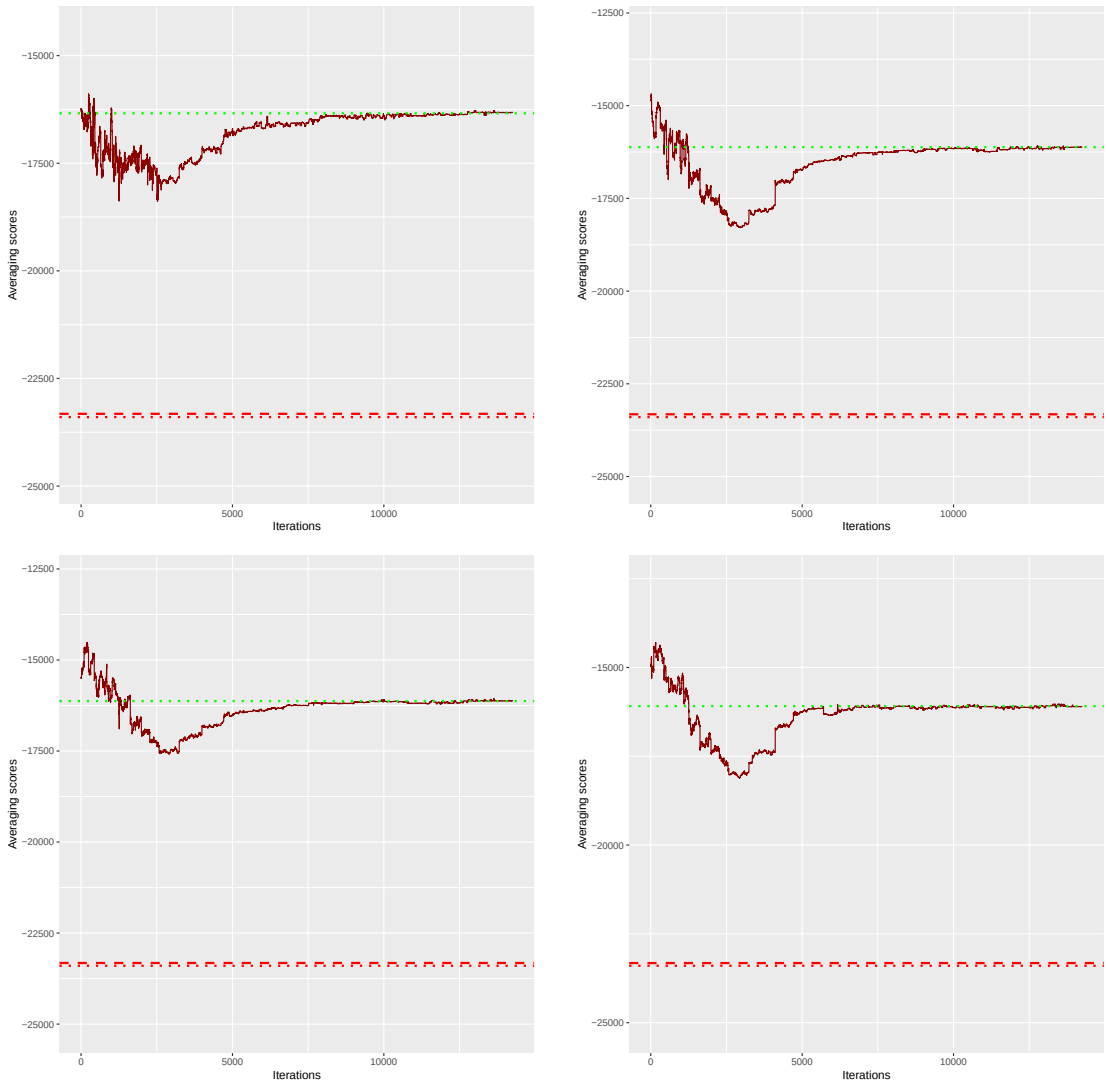

Table 47: Averaging score for variant 1 with **np = 25, 50, 75, 100**

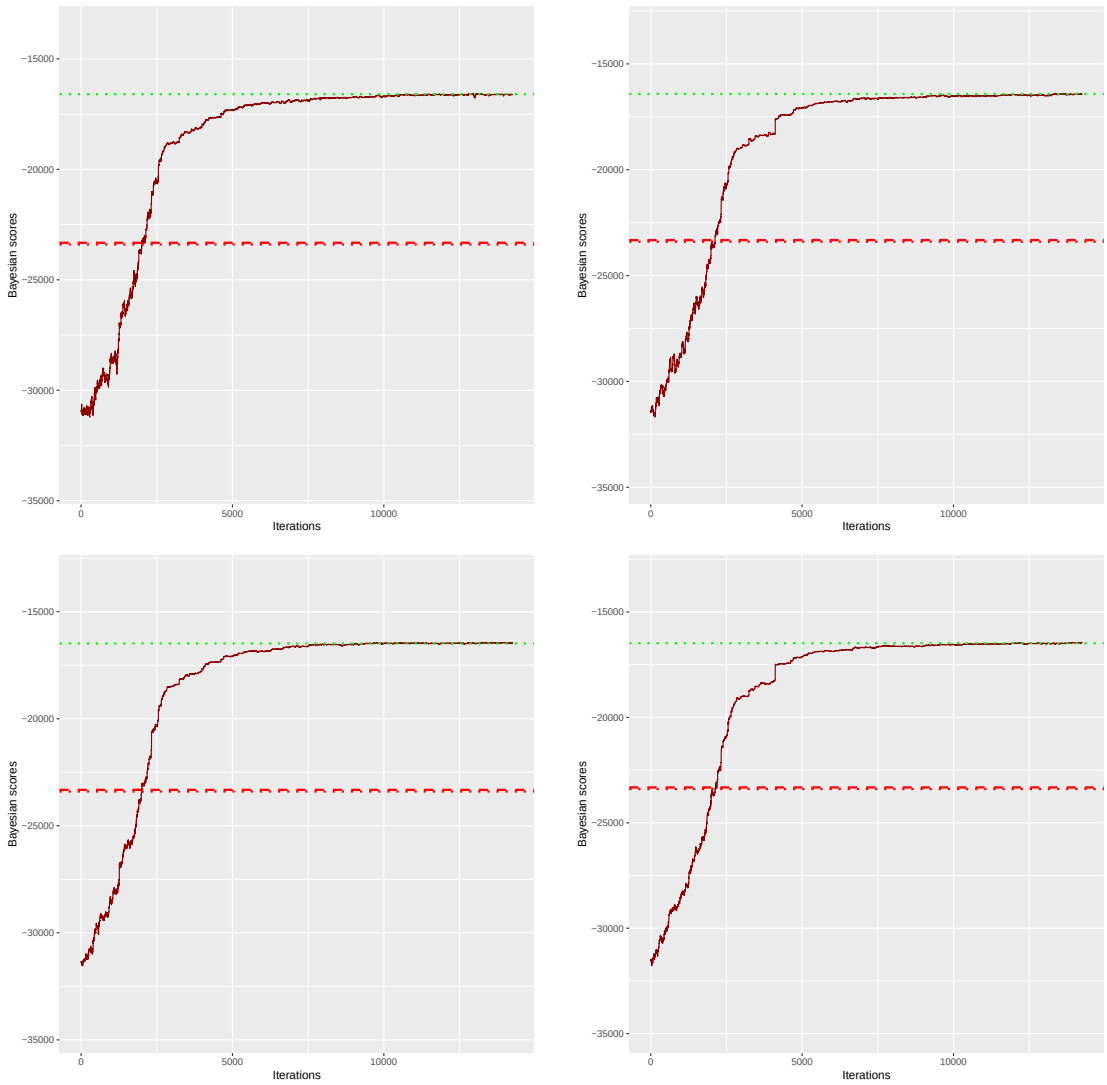

Table 48: Bayesian score for variant 1 with **np = 25, 50, 75, 100**

4.2 Graphics of evolution for variant 2

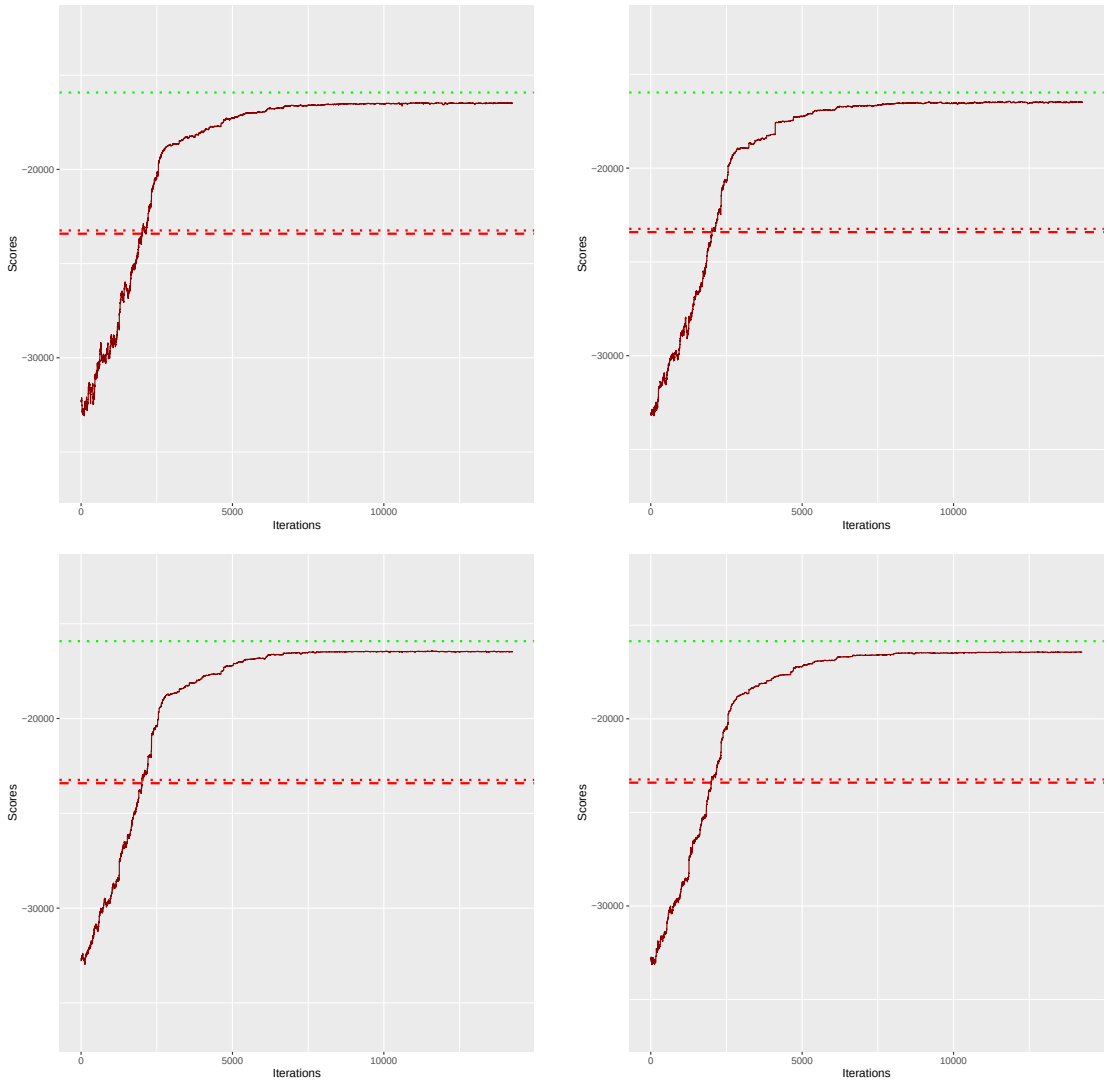

Table 49: Normal score for variant 2 with **np = 25, 50, 75, 100**

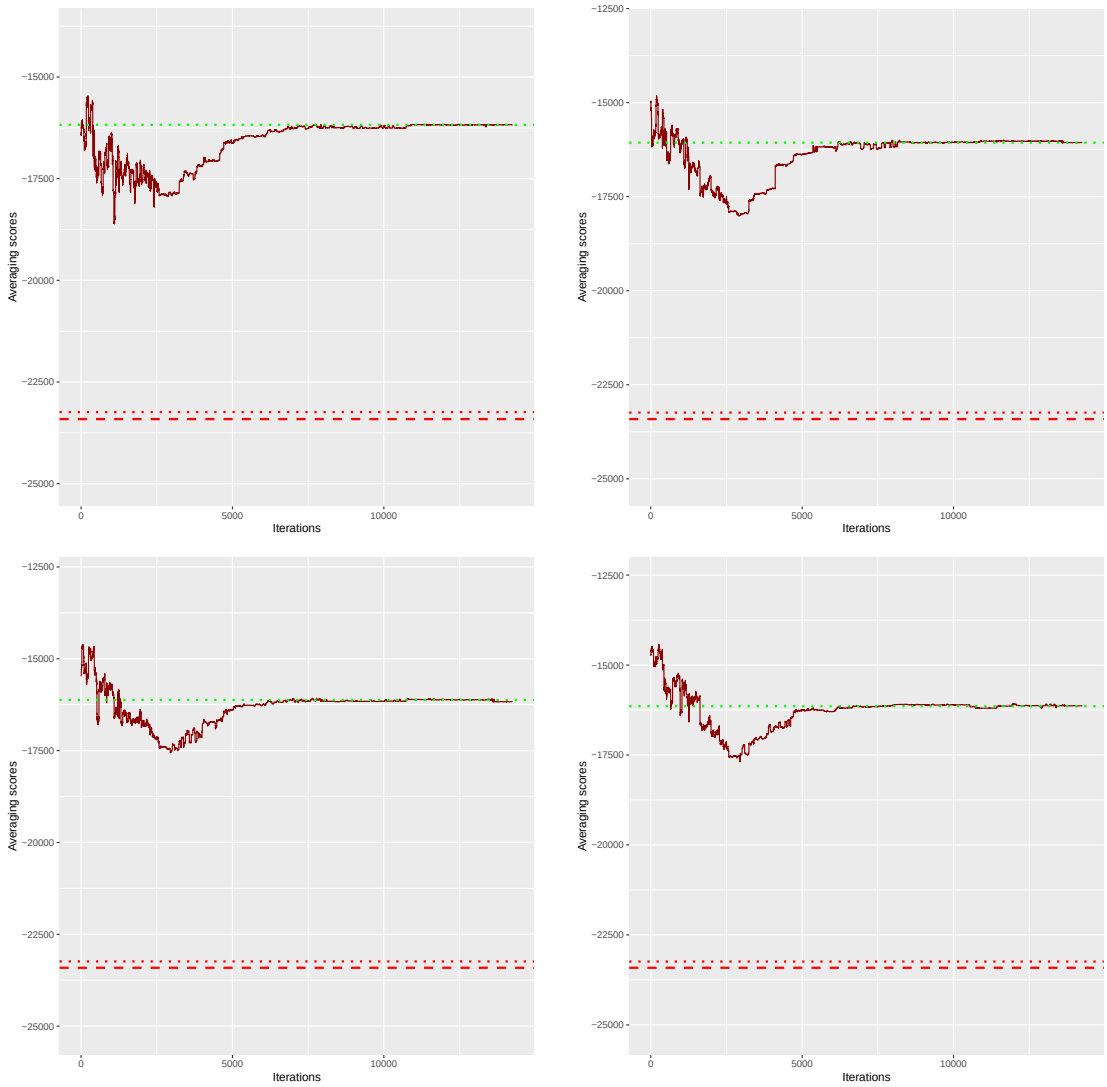

Table 50: Averaging score for variant 2 with **np = 25, 50, 75, 100**

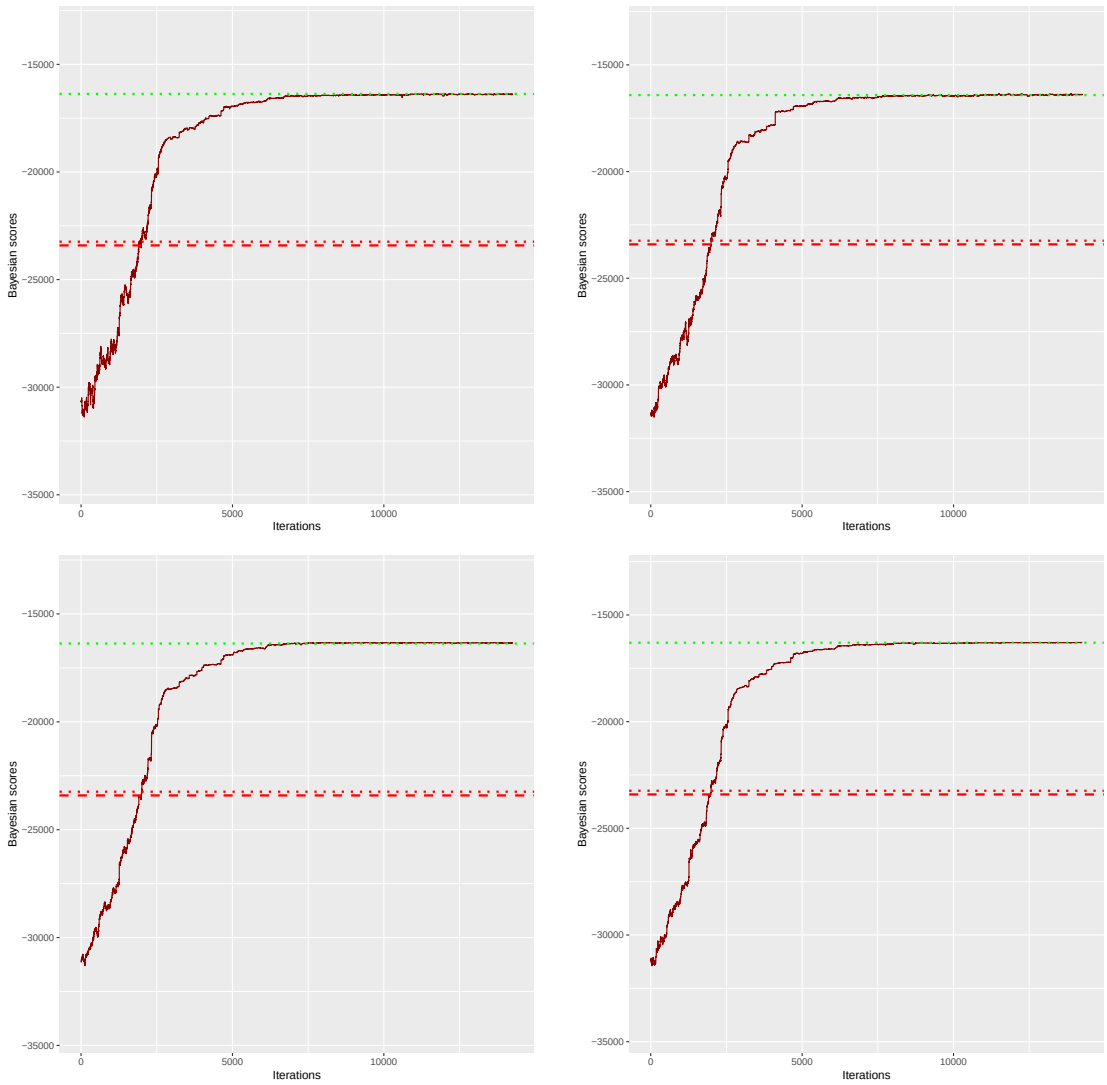

Table 51: Bayesian score for variant 2 with **np = 25, 50, 75, 100**

4.3 Graphics of evolution for variant 3

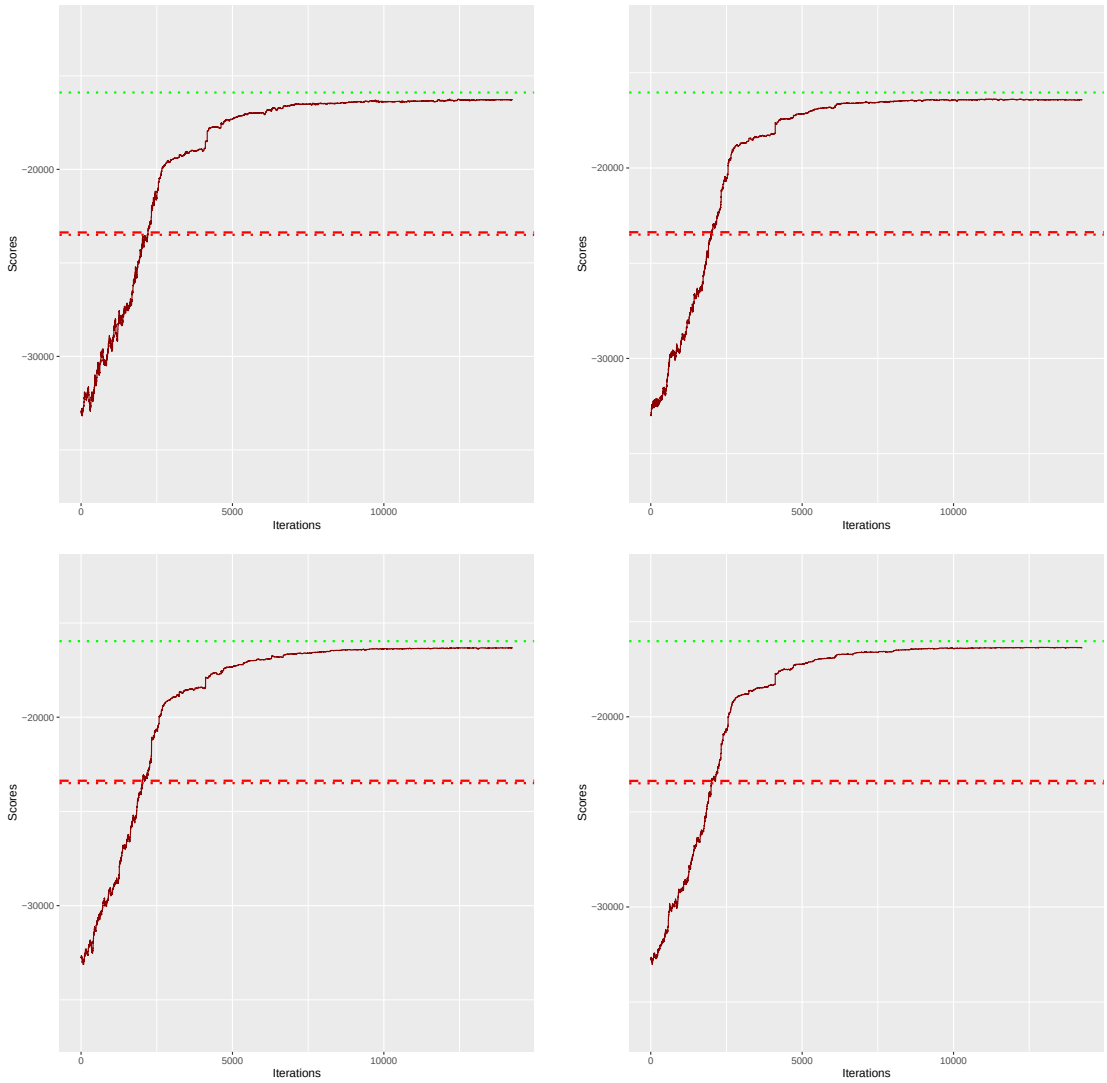

Table 52: Normal score for variant 3 with **np = 25, 50, 75, 100**

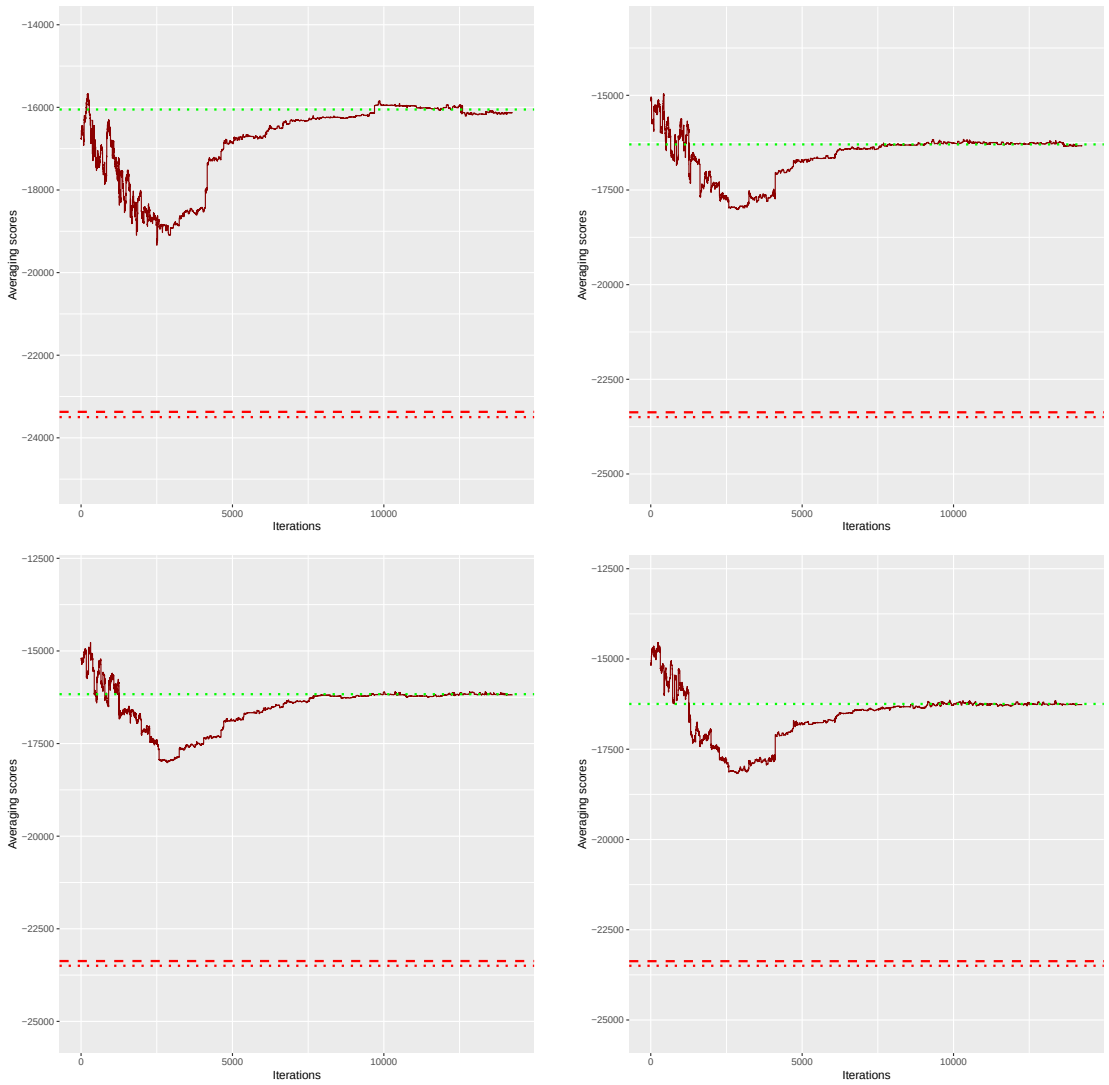

Table 53: Averaging score for variant 3 with **np = 25, 50, 75, 100**

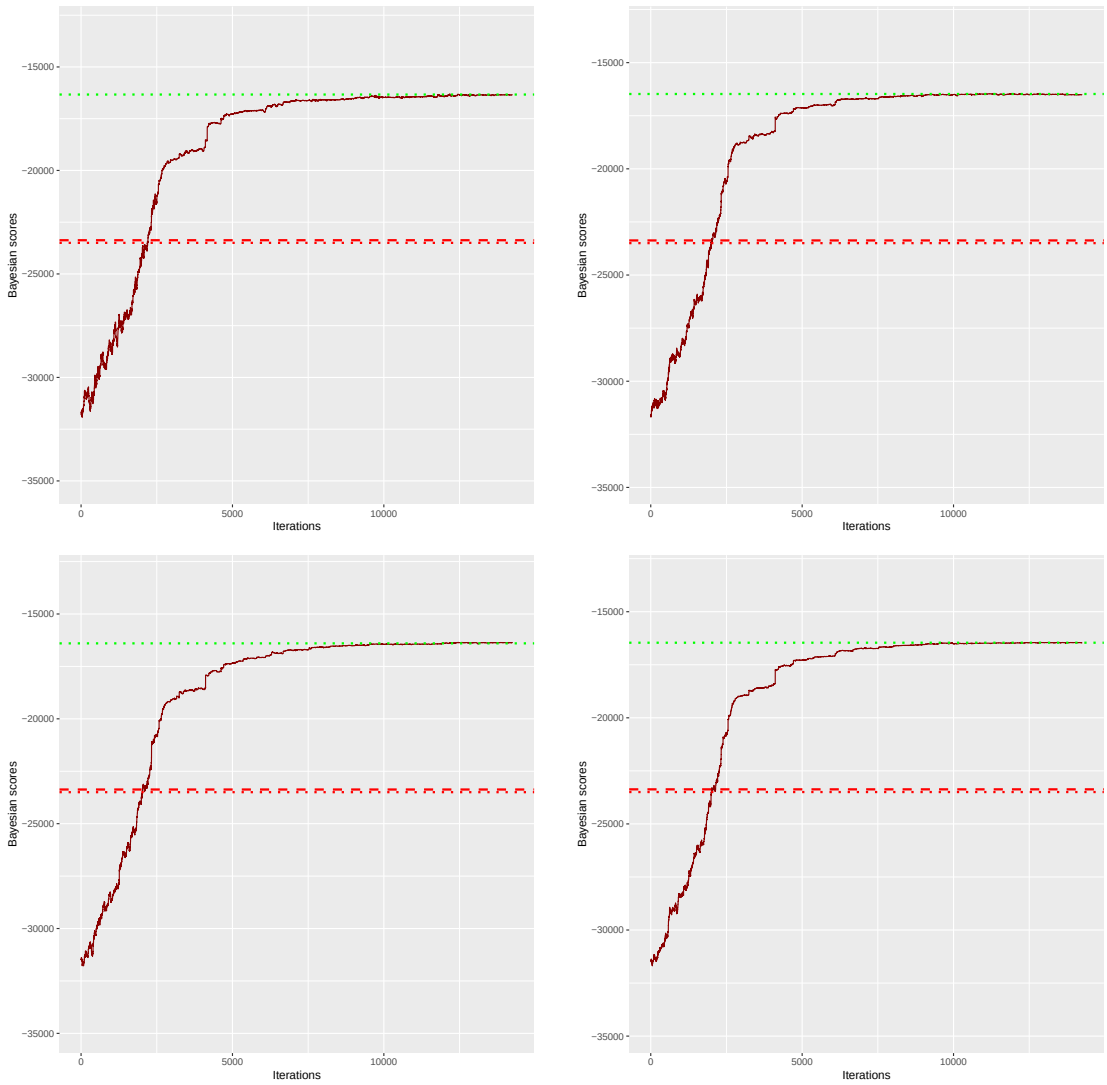

Table 54: Bayesian score for variant 3 with **np = 25, 50, 75, 100**

4.4 Graphics of evolution for variant 4

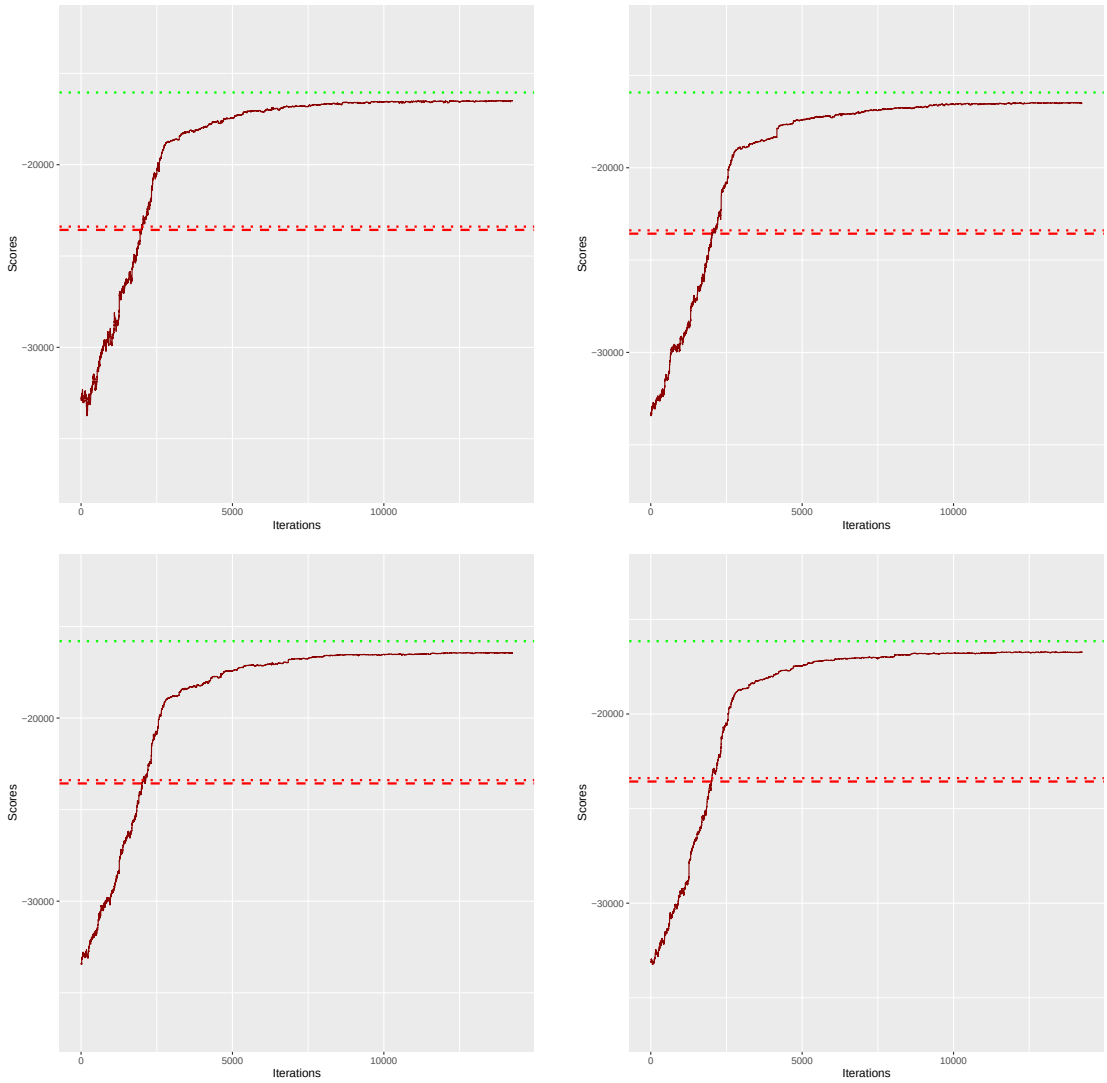

Table 55: Normal score for variant 4 with **np = 25, 50, 75, 100**

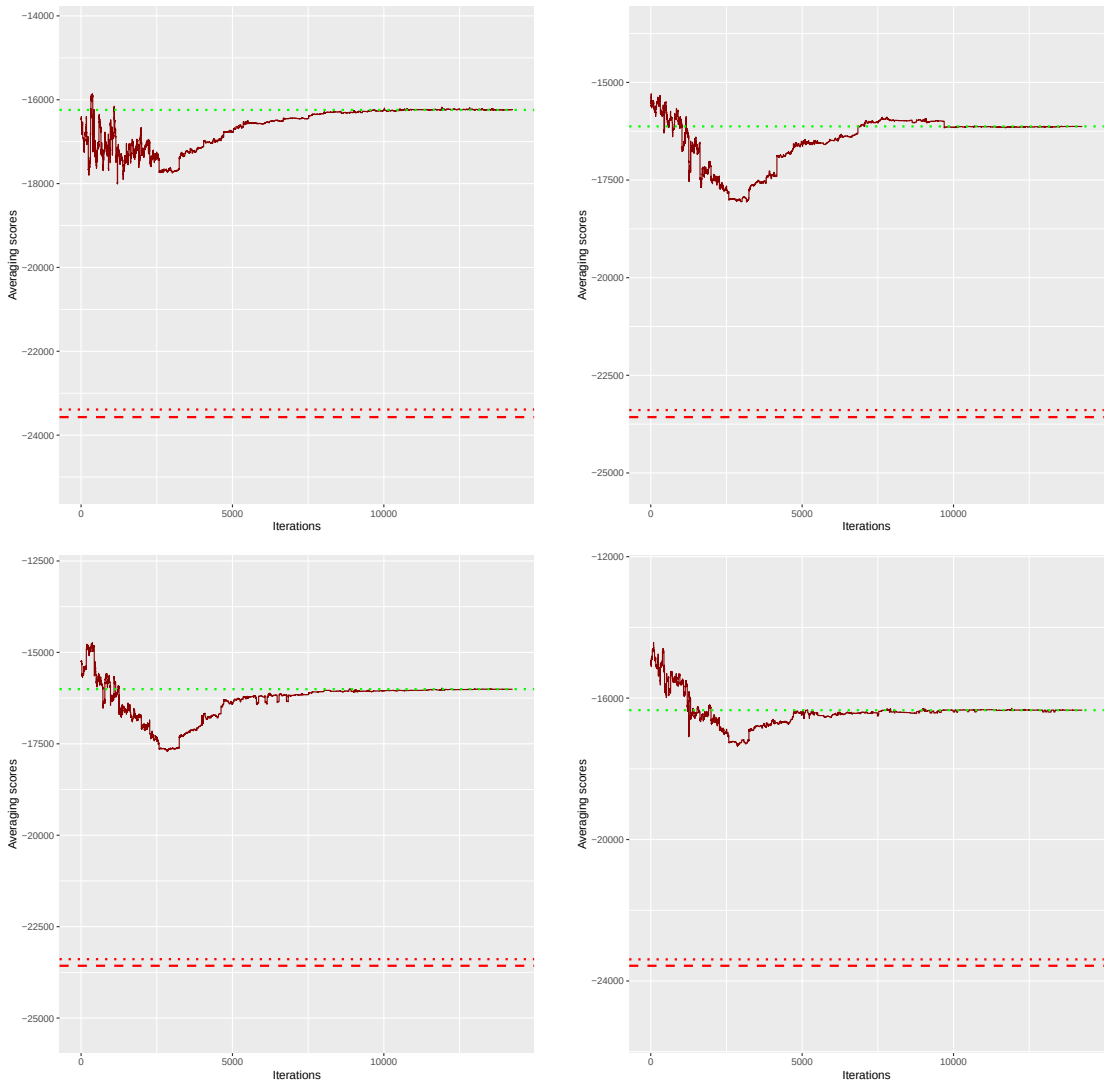

Table 56: Averaging score for variant 4 with **np = 25, 50, 75, 100**

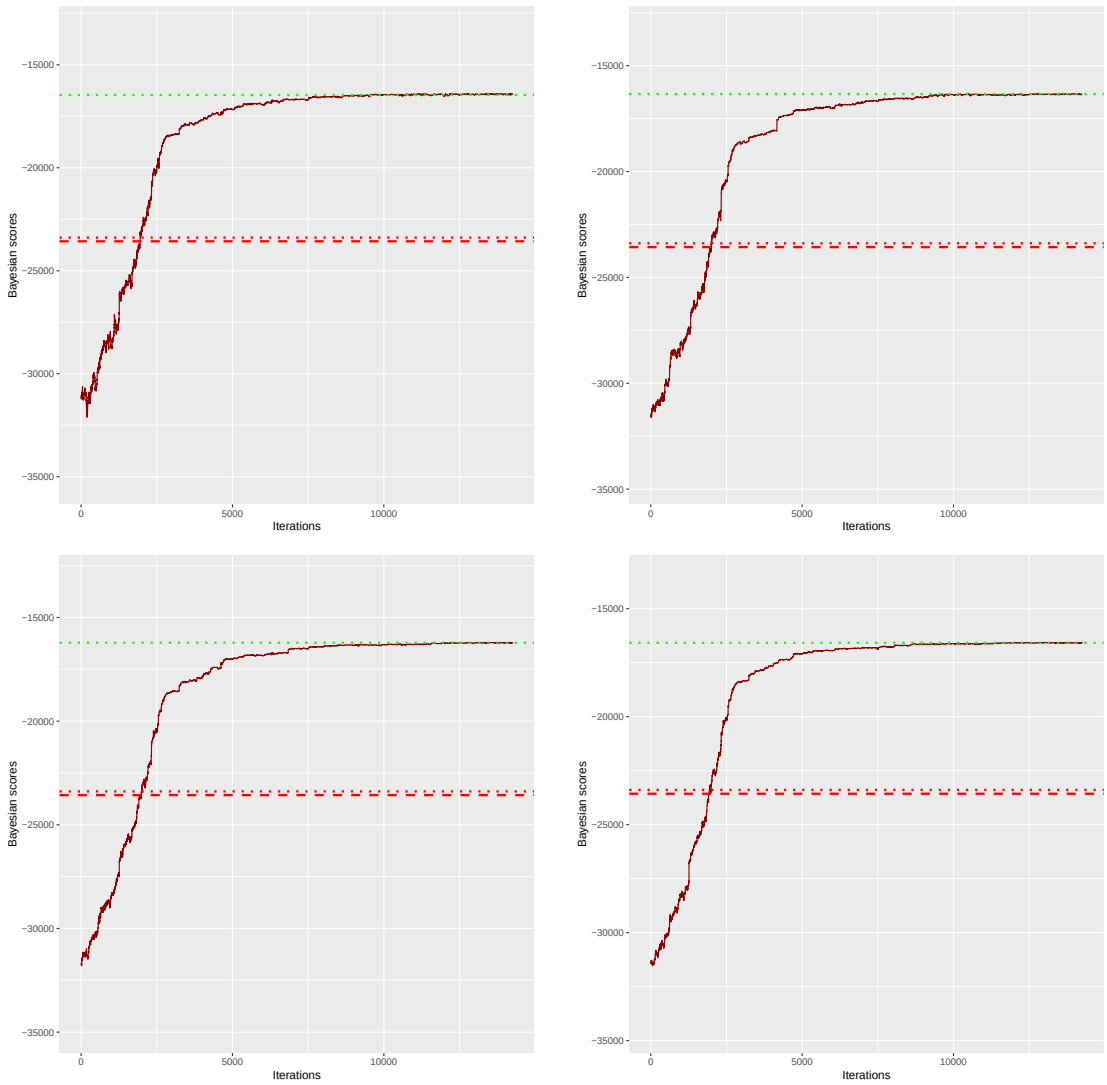

Table 57: Bayesian score for variant 4 with **np = 25, 50, 75, 100**

4.5 Graphics of evolution for variant 5

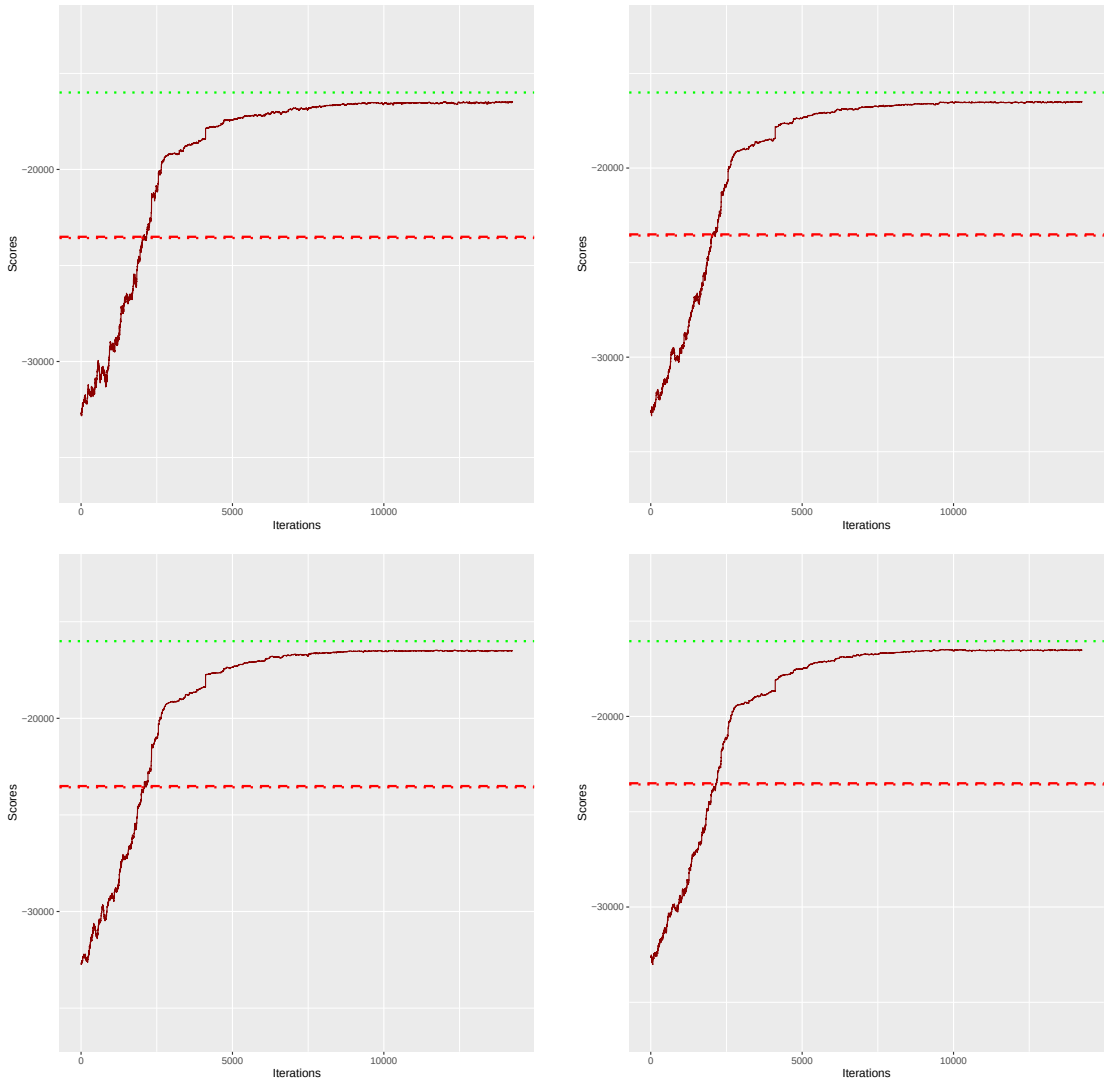

Table 58: Normal score for variant 5 with **np = 25, 50, 75, 100**

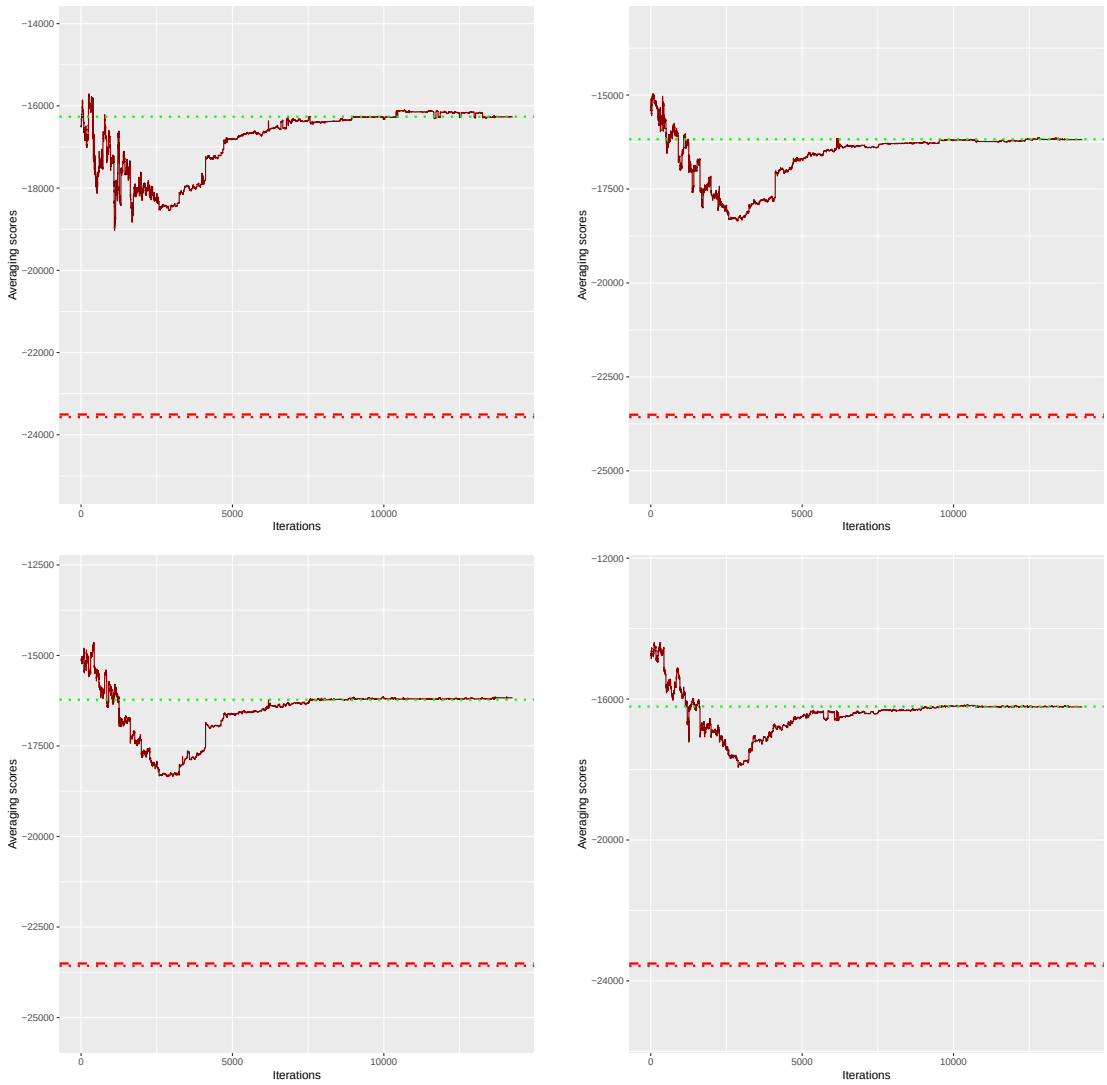

Table 59: Averaging score for variant 5 with **np = 25, 50, 75, 100**

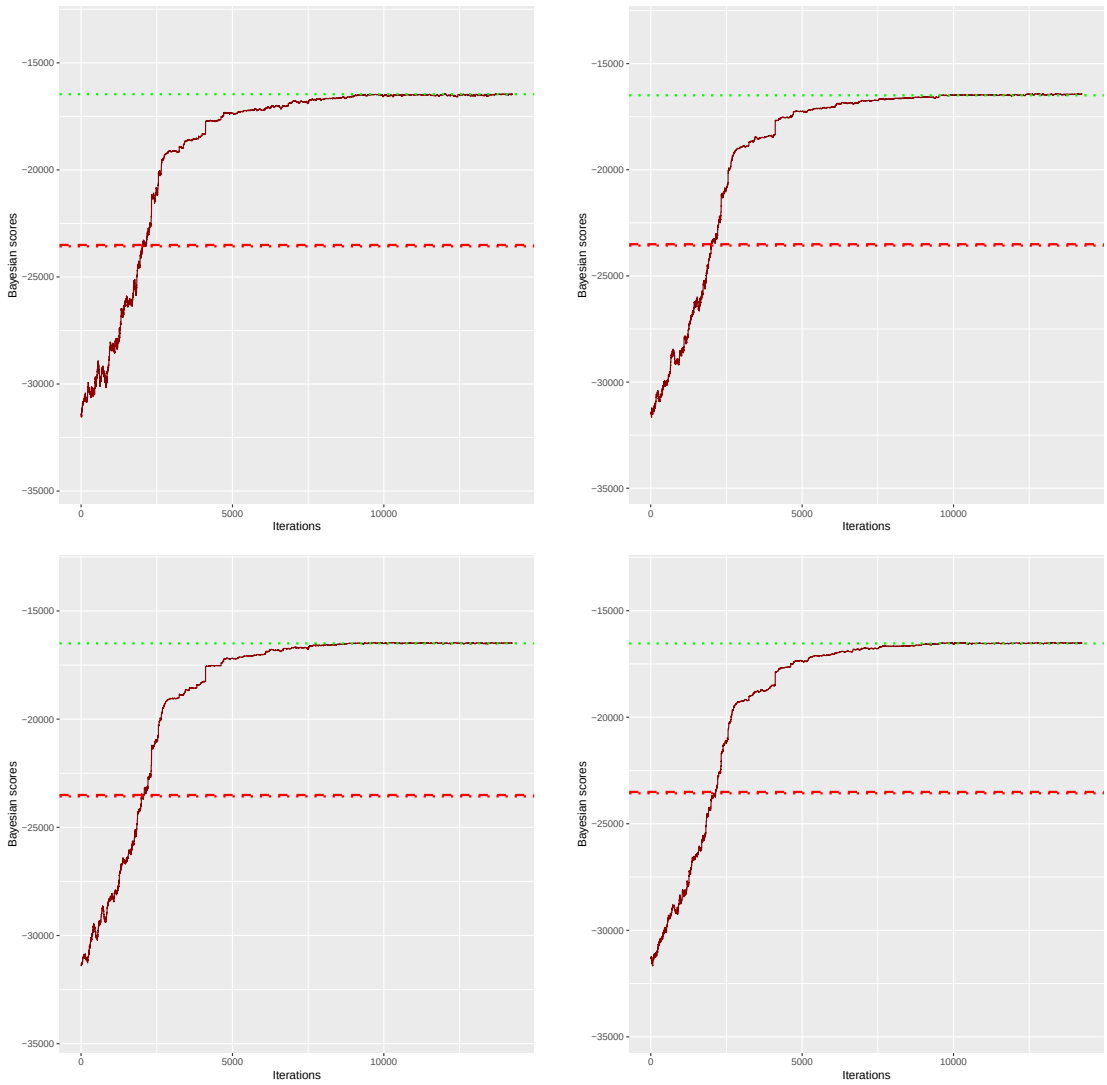

Table 60: Bayesian score for variant 5 with **np = 25, 50, 75, 100**