Escuela de Ingeniería Informática
Universidad de Oviedo

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Activity 2 Measurements

n	Time_BT_balancing	Time_BnB	Nodes_BT_Balancing	Nodes_BnB	ZNNC_BT_balancing	ZNNC_BnB
2	15	13	3	2	0	0,001778
3	35	29	12	7	0,883147	0,031431
4	93	100	39	9	0,688199	-0,03401
5	279	176	120	11	0,561228	-0,02361
6	854	333	363	14	0,564897	0,034337
7	2544	1067	1092	17	0,628446	0,016429
8	7645	1884	3279	19	0,681738	0,011135
9	22820	9818	9840	20	0,736648	0,021440
10	68918	22388	29523	22	0,786325	0,020328

Activity 3

COMPARE RESULTS, NUMBER OF NODES, AND TIMES FOR BACKTRACKING AND BNB IMPLEMENTATIONS

We can see that we get a smaller ZNNC on the Branch and Bound one and that are bigger on the Backtracking with balancing. Talking about times the BnB have so much better times than the Backtracking approach and it is common as Backtracking have always the best solution but with a huge complexity.

Activity 4

DISCUSS ABOUT THE EFFICIENCY OF BOTH TECHNIQUES BASED ON THE RESULTS OBTAINED. WHICH IMPLEMENTATIONS TAKES LONGER TIMES? WHICH IMPLEMENTATION GENERATES MORE NODES?

The BnB implementation takes less time than the Backtracking that is common considering that the Backtracking have a bad complexity. And, as we can know the Backtracking gives the best possible solution usually, but it has a bad complexity and a slow algorithm that we can see represented on the table having better result on the Backtracking but with less time on the Branch and Bound.

We have less nodes on the Branch and Bound approach because we are pruning more nodes than in the Backtracking one considering the heuristic we have implemented.