

Output Results

Branch-and-bound method (project 2)

Motif => ACCCC

Consensus score = 16 (This is a maximum possible score can get for the given sequences)

Number of iteration = 1161

Randomized method

This method generates different motifs and number of iterations every time it runs.

*Note: The stopping rule for this method is consensus score of 16, which is a maximum possible score

Since the results vary, I made a table for 10 runs for the method.

	Motif	Consensus Score	Number of Iterations
1	CCCCC	16	564
2	CCCCG	16	334
3	CCCCC	16	875
4	CCCCC	16	40
5	ACCGC	16	415
6	CCCCG	16	916
7	ACCCC	16	2687
8	CCCCC	16	131
9	CCCCG	16	1911
10	ACCCC	16	210

Comparison

Accuracy

Based on the consensus score for measuring the accuracy, both methods have the same score, which is 16. Both methods have the same degree of accuracy since I made the stopping rule to be consensus score of 16. However, by comparing the two methods in terms of accuracy as a function of their respective number of iterations, the randomized method seems to be more accurate than branch-and-bound method.

The branch-and-bound method obtained the consensus score of 10 for 10 iterations, score of 12 for 100 iterations, and score of 15 for 500 iterations.

For the randomized method, it obtained the score of [14, 12, 16, 14, 10] for 10 iterations, score of [11, 16, 11, 16, 12] for 100 iterations, and score of [10, 16, 16, 16, 16] for 500 iterations.

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CS490/590 Programming Assignment VII: Randomized Motif Finding

Timing

Since the result of randomized method varies, it is hard to tell which method takes shorter/longer time. As you can see above, randomized method sometimes took twice as much iterations than branch-and-bound method does (run 7). Also, it took almost one third of iterations of branch-and-bound method. However, the randomized method outperformed the branch-and-bound method most of the time.