

Ans 3:

To find the runtime we run the motif and median search codes on a collection of 10 DNA sequences each with length 10. We search motifs of length 8,10, and 12. The runtimes are given in the table below.

n	l	Motif search time(minutes)	Median search time(minutes)
40	8	0.9	0.033
40	10	0.75	0.616
40	12	0.66	11.9
40	14	23	261

It can be observed that runtime depends on both n and l. The time for median search is more than motif search as l increases, because it has to search all possible l-mers in the DNA which grows exponentially. For motif size less than 12 we can see median search is better than motif search. The following graph is made with n=20 and l from 2 till 12.

