

2) (10 pts) ANL (Algorithm Analysis)

(a) (5 pts) An algorithm to process an array of size  $n$  takes  $O(n^2)$  time. If the algorithm takes 113 ms to process an array of size 10,000 how long will it take to process an array of size 100,000, in seconds?

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(b) (5 pts) A search algorithm on an array of size  $n$  runs in  $O(\lg n)$  time. If 200,000 searches on an array of size  $2^{18}$  takes 20 ms, how long will 540,000 searches take on an array of size  $2^{20}$  take, in milliseconds?