Introduction to Algorithms: 6.006
Massachusetts Institute of Technology
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Handout # 5

Problem Set 5, Problem 3

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This problem set is due **Thursday, November 21** at **11:59PM**.

This solution template should be turned in through our submission site. [1]

For written questions, full credit will be given only to correct solutions that are described clearly *and concisely*.

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[1] Register an account, if you haven't done so. Then go to Homework, Problem Set 5, and upload your files.

Problem 5-3. [45 points] **Alien Autopsy**

(a) [10 points]

This part should be completed in `pset5_3_solution_template.py`.

(b) [10 points]

This part should be completed in `pset5_3_solution_template.py`.

(c) [5 points]

It will take $O(n \log n + a)$ time to run A^* and $O(Bd)$ time to call the Blackbox function B times. Thus, the asymptotic running time is $O(n \log n + a + Bd)$.

(d) [10 points]

This part should be completed in `pset5_3_solution_template.py`.

(e) [10 points]

We can use a DFS on this graph and return the time after all parents of the motor node have been activated, which we can run this algorithm in $O(N + A + Bd)$ time.