



✕ 判断题 2

A. 单选题 2

1-1 Randomized algorithms are for solving the problems with randomly generated inputs. (2分)



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1-1 答案正确 (2 分) 创建提问

1-2 The worst-case running time is equal to the expected running time within constant factors for any randomized algorithm. (2分)



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1-2 答案正确 (2 分) 创建提问





判断 2

A. 单选 2

2-1 If we repeatedly perform independent trials of an experiment, each of which succeeds with probability $p > 0$, then the expected number of trials we need to perform until the first success is: (3分)

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- ☐ A. $p/(1 - p)$
- ☐ B. $1/(1 - p)$
- ☒ C. $1/p$
- ☐ D. None of the above

$$P_i = (1-p)^{i-1}p$$

2-1 答案正确 (3 分) 创建提问

2-2 Given a 3-SAT formula with k clauses, in which each clause has three variables, the MAX-3SAT problem is to find a truth assignment that satisfies as many clauses as possible. A simple randomized algorithm is to flip a coin, and to set each variable true with probability $1/2$, independently for each variable. Which of the following statements is FALSE? (3分)

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- ☐ A. The expected number of clauses satisfied by this random assignment is $7k/8$.
- ☐ B. For every instance of 3-SAT, there is a truth assignment that satisfies at least a $7/8$ fraction of all clauses.
- ☐ C. If we repeatedly generate random truth assignments until one of them satisfies $\geq 7k/8$ clauses, then this algorithm is a $8/7$ -approximation algorithm.
- ☒ D. The probability that a random assignment satisfies at least $7k/8$ clauses is at most $1/(8k)$.

2-2 答案正确 (3 分) 创建提问