

CS 333202: Probability and Statistics

HW9 Part II

1. Suppose that the number of miles that a car can run before its battery wears out is exponentially distributed with an average value of 10,000 miles. If a person desires to take a 5000-mile trip, what is the probability that he or she will be able to complete the trip without having to replace the car battery? What can be said when the distribution is not exponential?
2. Consider a post office that is staffed by two clerks. Suppose that when Mr. Smith enters the system, he discovers that Ms. Jones is being served by one of the clerks and Mr. Brown by the other. Suppose also that Mr. Smith is told that his service will begin as soon as either Jones or Brown leaves. If the amount of time that a clerk spends with a customer is exponentially distributed with parameter λ , what is the probability that, of the three customers, Mr. Smith is the last to leave the post office?
3. Guests arrive at a hotel, in accordance with a Poisson process, at a rate of five per hour. Suppose that for the last 10 minutes no guest has arrived.
 - (a) What is the probability that the next one will arrive in less than 2 minutes?
 - (b) What is the probability that from the arrival of the tenth to the arrival of the eleventh guest takes no more than 2 minutes?