Tutorial 5c (Exponential Distribution)

1. The time intervals between successive barges passing a certain point on a busy waterway have an exponential distribution with mean 8 minutes.

   (a) Find the probability that the time interval between two successive barges is less than 5 minutes.

   (b) Find a time interval t such that we can be 95% sure that the time interval between two successive barges will be greater than t.

2. Suppose that the time between customer arrivals at a store follows an exponential distribution with a mean of 10 minutes. What is the probability that the time between two consecutive customers is less than 5 minutes?

3. Suppose that the lifetime of a certain electronic component follows an exponential distribution with a mean of 1000 hours. What is the probability that the component will fail within 500 hours?

4. Suppose that the time between machine breakdowns at a factory follows an exponential distribution with a mean of 200 hours. If a machine has been running for 100 hours without a breakdown, what is the probability that it will break down within the next 100 hours?