Exercise 1

The time, T, required for a search in a file fluctuates uniformly from 1 to 5 seconds. If a process requires searching in 50 files:

a) Which is the random variable and its distribution?
b) Which is the mean and the standard deviation for the complete search in the process?

Exercise 2

A company that makes wireless mice has introduced a new chip that allows to increase the battery life. The introduction of this chip produces that 50% of the cases the battery lifetime arrives to 5.55 months. If the lifetime battery is distributed as an exponential:

a) What is the random variable and its distribution?
b) Compute the probability that lifetime battery was greater or equal than the mean?
c) Which should be the battery lifetime, t, to obtain a 95% of reliability?

Exercise 3

The time, T, required for a query in a computer is distributed as an exponential of parameter α. It is known that durations of 10% of queries are greater than 20 seconds. Answer the following questions:

a) What is the value for α?
b) What is the mean for T?
c) What is the probability that a query duration was greater than 30 seconds?
d) Compute the median of T and compute it with the mean.

Exercise 4

A company that produces chips considers a chip as defective if its lifetime is lower than 100 hours. If the duration in hours of a chip follows an exponential distribution with mean of 100 hours. Answer the following questions:

a) If a chip has been running for 500 hours. Which is the probability that the total running time was greater than 1000 hours?
b) This company sell the chips that produces in boxes of 50 units. Which is the probability that a box contains more than one defective chip?