

CS 206 - Introduction to Discrete Structures II

September 21, 2016

Homework: 2

Instructor: Morteza Monemizadeh

Due Date: Wednesday, September 28 (12:10 pm) TA: Hareesh Ravi

Assignment 1:

A system is comprised of 5 components, each of which is either working or failed. Consider an experiment that consists of observing the status of each component, and let the outcome of the experiment be given by the vector $(x_1, x_2, x_3, x_4, x_5)$, where x_i is equal to 1 if component i is working and is equal to 0 if component i is failed.

1. How many outcomes are in the sample space of this experiment?
2. Suppose that the system will work if components 1 and 2 are both working, or if components 3 and 4 are both working, or if components 1, 3, and 5 are all working. Let W be the event that the system will work. Compute the probability that the event W occurs.
3. Let A be the event that components 4 and 5 are both failed. Compute the probability that the event A occurs.
4. Write out all the outcomes in the event $A \cap W$ and compute the probability that the event $A \cap W$ occurs.

Assignment 2:

Suppose that A and B are mutually exclusive events for which $P(A) = .3$ and $P(B) = .5$. What is the probability that

1. either A or B occurs?
2. A occurs but B does not?
3. both A and B occur?

Assignment 3:

If a die is rolled 4 times, what is the probability that 6 comes up at least once?