Donald E. Brown
Bill Basener DS 6014

Exercise 1.3
Univariate Probability Distributions and Expectations

Instructions: You may discuss this assignment with other students in the class, but you must submit your own answers to the questions below. Include an honor pledge with your submission. Submit online and in pdf. This exercise is ungraded.

1. Suppose a core in a processor fails with probability $(1-p)$. A processor will operate successfully in a cluster if at least 50% of the cores are working. For what values of p is a quad core processor more reliable than a duo core processor?

2. If the number of accidents that occur on a highway each month is Poisson with $\lambda = 3$ what is the probability of an accident free month?

3. If body mass index (BMI) is Gaussian distributed random variable with a mean of 22.5 and a standard deviation of 1.25, what is the likelihood of someone having a BMI >28?

4. Let X, Y be independent Poisson random variables with parameters λ_1 and λ_2 respectively. What is the expectation of $X + Y$?