

## HW 5

1. (15pt) A fisherman is restricted to catching at most two red grouper per day when fishing in the Gulf of Mexico. A field agent for the wildlife commission of inspects the day's catch for boats as they come to shore near his base. He has found that the number of red groupers caught has the following distribution

|                    |     |     |     |
|--------------------|-----|-----|-----|
| Number of groupers | 0   | 1   | 2   |
| Probability        | 0.2 | 0.7 | 0.1 |

Find the expectation, the variance, and the standard deviation for the individual daily catch of red grouper.

2. (20pt) For a laboratory assignment, if the equipment is working, the density function of the observed outcome  $X$  is

$$f(x) = \begin{cases} 2(1-x), & 0 < x < 1, \\ 0, & \text{otherwise.} \end{cases}$$

Find the mean, variance, and standard deviation of  $X$ .

3. (45pt) From a sack of fruit containing 3 oranges, 2 apples, and 3 bananas, a random sample of 4 pieces of fruit is selected. If  $X$  is the number of oranges and  $Y$  is the number of apples in the sample, find
- (5pt) the joint probability distribution of  $X$  and  $Y$ , and (5pt) the joint probability table;
  - (20pt) the covariance between  $X$  and  $Y$ ;
  - (15pt) the correlation coefficient of  $X$  and  $Y$ .
4. (20pt) Let  $X$  represent the number that occurs when a green die is tossed and  $Y$  the number that occurs when a red die is tossed. Find the variance of the random variable
- $2X - Y$ ;
  - $X + 3Y - 5$ .