Homework assignment 08

Please read these instructions carefully for each assignment, though they are generally do not vary between the assignments

1. You need to follow carefully the specific instructions for the assignment as written below.

2. For the first stage, each student must submit his/her solution set as a *single* pdf file to NYUClasses. You can submit a scanned pdf, or pdf converted from jpg photos. But multiple pdfs must be joined together. (Translation: have kindness for the graders, who have lives to live, and will have a lot of solutions to process.) Alternatively, you can produce a text-based pdf from a processing system such as MS word or (much better yet:) LaTeX. *Caveat:* If you submit handwritten solutions, the readability is your responsibility.

3. Leave 1.5 inches (or 4.0 centimeters) of space between each part of each problem for the second stage.

4. The submissions for the first stage are due on Tuesday, November 7 by 11:55pm.

5. Solutions will be posted or handed after the lecture on Wednesday, November 8.

6. Once you get the solutions you are required to self-criticize your original answers as described below. Based on the handout solutions, use space that follows each homework answer, as described in item 3 to write your own self-criticisms of your answers. Do *not* re-write your solution, add material to you original solution as written.

   A good self-criticism *briefly*

   - points explicitly at the mistakes of your solution,
   - summarizes the idea, step, or technique that you had missed.

   It is not enough to just mention some ideas from the correct solution, you have to explain how these ideas are related to your initial solution. If you think that your solution is correct, write this explicitly.

   Additional requirement: mark correct submissions with a green check, and write your self-criticisms in red. If you are uncertain if an answer is correct, say so in blue.

7. The submissions for the second stage are due to Friday, November 10 by 11:55pm.

8. For every problem below, the number of points is specified as "$a + b$ points". This means that you get from 0 to a points for your solution submitted on the first stage and form 0 to b points for your self-criticism. In total, you get at most $a + b$ points for the problem.

9. Be sure to follow the academic integrity rules listed on the course webpage. The department and the university treat academic integrity very seriously and I am required to report all possible violations.

Attention: In all problems below you have to explicity state what is your set of elementary events.

Problems

Problem 1: (2 + 1 points) A coin is tossed three times. What is the probability that heads occur exactly once?

Problem 2: (3 + 1 points) A die is rolled five times. What is the probability that exactly two of the results are equal to three?

Problem 3: (3 + 1 points) An algorithm generates a random integer i from 1 to 5 and then a random integer j from 1 to 5. What is the probability of i being strictly greater than j?

Problem 4: (3 + 1 points) A die is rolled once. Are the events A = "the result is even" and B = "the result is strictly greater than three" independent?

Problem 5: (3 + 1 points) A die is rolled twice. Find the probability for the minimum of two results to be equal to three.

Problem 6: (4 + 1 points) Consider a complete graph with 4 vertices (i.e., every two vertices are connected by an edge). For each of the 6 edges we toss a coin, and if heads occur, then we erase the edge. Let X be the number of triangles in the graph. Find $E(X)$.

Reading: The notes posted on the webpage of the course.