

Matlab programming exercises: The NJ Lottery (Pick 3, Pick 4) Simulator ME345 – Modeling and Simulation

In addition to the NJ Pick Six Lottery, there are additional games (NJ Pick 3, NJ Pick 4) with or without a special additional ball (as of March 2017, the NJ Lottery referred to this as additional ball as the “Fireball”). In these types of games, players are asked to pick a certain number of values between 0 and 9, with winning payouts given if the balls drawn in the lottery match the player guesses.

Different from the NJ Pick 6 Lotto, the order of the balls can be important, as picking the numbers in the exact order the balls were drawn (i.e. “straight”) receives a higher payout than only getting the right numbers but in the wrong order (which is called hitting it “boxed”).

For example, in a traditional NJ Pick 3 game, if the user picks the numbers 7 – 1 – 5, the following combinations of balls drawn would be considered winners:

- If playing it “straight” (largest payout): 7 – 1 – 5
- If playing it “boxed” (smaller payout): 1 – 5 – 7, 1 – 7 – 5, 5 – 1 – 7, 5 – 7 – 1, 7 – 5 – 1, 7 – 1 – 5 (this last value would also result in a “win” if played straight).

Develop a simulation that allows you to mimic playing a large number of such games and to analyze the probabilities of such games of chance. The Matlab command *setxor* may be of assistance in this assignment.

You may wish to refer to the “Odds and Prizes” section of the NJ Lottery website at <https://www.njlottery.com/en-us/drawgames/dailygames/pick4.html#tab-oddsAndPrizes>.