Workshop #4 Exercises

1. Michael is throwing darts at a target. He is very good at the game, so the chances of him hitting the "bullseye" (i.e. the center) are 25%. It is reasonable to assume that individual **attempts are independent**. If he throws 5 times in total, what is the probability that he will hit the bullseye:

a) Exactly three times b) at least 3 times

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2. Only two international airlines fly daily into an airport. UN Air has 70 flights a day and IS Air has 65 flights a day. Passengers flying with UN Air have an 18% probability of losing their luggage and passengers flying with IS Air have a 23% probability of losing their luggage. You overhear someone in the airport complain about her luggage being lost. Find the probability that she travelled with IS Air.

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3. Two friends have agreed to meet up between 13:00 and 14:00 on a given day. Both arrive randomly during the given time interval. They have also agreed that whoever arrives first waits for the other for at most 15 minutes, after which he leaves if the second friend has not arrived. What is the probability that the two friends will meet?

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4. The file `major_salary.csv` contains data about monthly salaries and majors for some employees.

a) Consider all the salary data. Construct a histogram and a box plot to visualize the distribution of the salaries. Then calculate the Five-Number-Summary[1] of the salaries for all employees and the skewness coefficient.

b) Using the 1.5×IQR rule, identify and list any outliers in the set of all salaries.

c) Now consider the data about the salaries categorized by major. Visualize the mean salaries for each major using a bar graph.

Answers to the simulation problems:

1. a) 0.08789 b) 0.1035

2. 0.543

3. 7/16 = 0.4375

[1] Five-Number-Summary: min, Q_1, median, Q_3 and the max