# Business Programming MSCI:3020/9200

**Homework Assignment #2**

**Due:** Thursday, February 21st, 2019 @ 11:59 pm

**Problem 1: Choosing Your Investment (5 points)**

We are going to expand on the Gambler.java program from Section 1.3. Instead of modeling it as a series of $1 bets, you will imagine you are a company that is making a decision on two different investments.

You are an up and coming business that specializes in making all sorts of delicious fried foods (funnel cakes, empanadas, samosas, etc.) with a healthier oil that gives less trans fat to consumers. You are deciding whether to open a food truck that you can take around town to concerts and sporting events or open up a small store front in a shopping plaza.

(3 points)

1. You have done sales and costs projections and know that the food truck will have an upfront investment of $50,000. The store front will have an upfront investment of $10,000 and rent of $5,000 taken out at the 30th,60th,90th and 120th day of your business.

The probabilities of **profit each day** for each investment are as follows:

**Food Truck**

* $4,000 35%
* $2,000 30%
* -$1,000 35%

**Store Front**

* $2,500 30%
* $1,500 40%
* $500 30%

Your business partners are giving you 120 days to show a profit of $150,000 so that this money can be reinvested. Run *n* number of simulations and output how many times the food truck reaches this $150,000 threshold for both the food truck and the store front.

1. Let *n* = 100
2. Let *n* = 1,000
3. Let *n* = 10,000

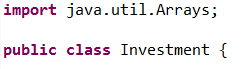
**What do you notice as a trend with these Monte Carlo simulations?**

**Which investment would you recommend for your fried food company?**

**Make a case for why your investors would want to invest in the other project as well.**

(2 points)

1. Use two arrays to collect the profits for the food truck and store front for each of the n trials. After doing this, import the Arrays package using import java.util.Arrays above your class name like below:



Then, printing out an array is as simple as doing System.out.println(Arrays.toString(array\_name));

**Print out your food truck and store front arrays for n=100 trials of the Monte Carlo simulation.**

**Using your arrays, print out the maximum, minimum and mean for the store front option and the food truck option with each of the following simulations? (Hint: you can use a for loop to do this)**

1. Let *n* = 100
2. Let *n* = 1,000
3. Let *n* = 10,000

An example output for n = 10 trials would like this:

7 out of 10 trials the food truck produced at least $150,000 profit.

4 out of 10 trials the store front produced at least $150,000 profit.

Percent of times food truck met profit threshold = 70.0

Percent of times store front met profit threshold = 40.0

Food Truck

[158000, 157000, 168000, 133000, 129000, 147000, 165000, 191000, 162000, 164000]

Store Front

[146000, 148000, 156000, 140000, 150000, 150000, 142000, 147000, 147000, 159000]

Food Truck:

Average profit = $157,400

Max profit = $191,000

Min profit = $129,000

Store Front:

Average profit = $148,500

Max profit = $159,000

Min profit = $140,000

**Your homework should consist of an Eclipse project with a class that runs the above questions and takes number of trials as the input. You will then include a word or text file answering the questions in A and printing your output for n=100, n=1,000 and n=10,000 trials. \*\*Keep in mind you only should print your full array for the n=100 trials, and print out the other information for the 1,000 and 10,000 trials\*\* You can include your text file in the project, zip the folder and submit to ICON.**