Jeremy Scheuerman

Doctor Spickler

COSC 117

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Homework 9 logic

1. WANT: Find if deck is a derangement or not

HOW: Create 2 decks make one of them a stock deck and shuffle the other , run this through a loop, user amount of times

NEED: Only needs amount of trials from the user

Output

-1

Input the number of trials(100-1,000,000): 4500

The number of shuffles with derangements were: 2839

This makes the probability for getting a derangement 0.6308888888888889

This makes 1 over the probability for getting a derangement 1.5850651637900668

-2

Input the number of trials(100-1,000,000): 43563

The number of shuffles with derangements were: 27511

This makes the probabbility for getting a derangement 0.631522163303721

This makes 1 over the probabbility for getting a derangement 1.5834757006288394

-3

Input the number of trials(100-1,000,000): 576675

The number of shuffles with derangements were: 364466

This makes the probabbility for getting a derangement 0.632012832184506

This makes 1 over the probabbility for getting a derangement 1.5822463549412016

1. WANT: create an array of sphere objects with set properties

HOW: using sphere object, populate arrays with spheres or random sizes (between certain parameters)

NEED: User input for amount of spheres and whether or not to print the list info

Output ( I input numbers somewhat lowish for these trials to make scrolling through this document less tedious) – also added an identifier for each sphere to make checking collisions easier

-1

Input the number of spheres (5-100) : 7

Print Sphere Information (Y/N) : y

Print Collision List (Y/N) : y

Sphere 1

Center: (2.6346794751643614, -0.278679198312334, 8.129320539908267)

Radius: 3.074490397641035

Volume: 91.29968846570327

Surface Area: 118.78350771334956

Sphere 2

Center: (-3.8718893772726695, -0.8195132404437828, 6.459542119120577)

Radius: 1.0542779034007488

Volume: 3.6814184575784745

Surface Area: 13.967544783793521

Sphere 3

Center: (7.651865639030266, -0.8831900501994596, 6.40200203563429)

Radius: 2.073192199840192

Volume: 27.994232888631934

Surface Area: 54.011842974886385

Sphere 4

Center: (9.804734173196934, -4.362896861171659, 7.237900514640739)

Radius: 2.7383664630499447

Volume: 64.50963352224385

Surface Area: 94.2308261406242

Sphere 5

Center: (-3.2434691157597015, 6.440378182734378, 5.946000873007408)

Radius: 2.1750737688524313

Volume: 32.32747952697749

Surface Area: 59.450819535253686

Sphere 6

Center: (5.847068280285413, -4.179501123774976, 3.0324112570968573)

Radius: 3.3611278363712365

Volume: 119.29025435895608

Surface Area: 141.96455495455956

Sphere 7

Center: (-3.764229029781541, -0.3549443990832817, 4.974309879569821)

Radius: 1.1451698530635281

Volume: 4.718017988532017

Surface Area: 16.4797142569218

Collision List:

Spheres 2 and 7

Spheres 3 and 4

Spheres 3 and 6

Spheres 4 and 6

Number of Collisions: 4

-2

1. WANT: An array inputted by the user and the transpose of said array

HOW: Do error checking for rows and columns populate the array with user input Then create an array except when repopulating with previous array flip columns and to inputs by user to get transpose of array

NEED: User input for size of array and for all values within the array

Output

-1

Input the number of rows: 6

Input the number of rows: 7

Input the number of rows: 5

Input the number of columns: 0

Input the number of columns: 3

Input R1 C1: 2

Input R1 C2: 6

Input R1 C3: 3

Input R2 C1: 8

Input R2 C2: 5

Input R2 C3: 66

Input R3 C1: 34

Input R3 C2: 6

Input R3 C3: 3

Input R4 C1: 8

Input R4 C2: 5

Input R4 C3: 3

Input R5 C1: 4

Input R5 C2: 5

Input R5 C3: 2

Original Table

2 6 3

8 5 66

34 6 3

8 5 3

4 5 2

Transpose

2 8 34 8 4

6 5 6 5 5

3 66 3 3 2

-2

Input the number of rows: 3

Input the number of columns: 4

Input R1 C1: 5

Input R1 C2: 547

Input R1 C3: 4

Input R1 C4: 3

Input R2 C1: 7

Input R2 C2: 5

Input R2 C3: 5

Input R2 C4: 55

Input R3 C1: 4

Input R3 C2: 456

Input R3 C3: 63

Input R3 C4: 4

Original Table

5 547 4 3

7 5 5 55

4 456 63 4

Transpose

5 7 4

547 5 456

4 5 63

3 55 4

-3

Input the number of rows: 6

Input the number of rows: 3

Input the number of columns: 3

Input R1 C1: 44

Input R1 C2: 3

Input R1 C3: 8

Input R2 C1: 4

Input R2 C2: 7

Input R2 C3: 55

Input R3 C1: 34

Input R3 C2: 226

Input R3 C3: 4

Original Table

44 3 8

4 7 55

34 226 4

Transpose

44 4 34

3 7 226

8 55 4

1. WANT: Print statistic type table for a bunch of randomly generated values between -50 and 50

HOW: Making 2d arrays to store these values and populate the arrays. A lot of for loops , repurposed some previous methods for variance and average stuff, swap arrays into each other. Use nested for loops to count rows or columns individually

NEED: Input from the user for how many rows and columns to do

Output

-1

Input the number of rows: 4

Input the number of columns: 7

-8.84 -19.25 -45.59 35.73 -3.91 47.62 24.67

16.98 12.26 48.28 18.21 13.64 24.55 -27.49

42.54 -31.38 13.24 -2.93 32.93 -43.24 14.54

28.52 7.30 4.89 8.87 34.32 30.84 34.05

4.35 33.07

15.20 22.46

3.67 31.75

21.26 13.51

-8.84 -31.38 -45.59 -2.93 -3.91 -43.24 -27.49

42.54 12.26 48.28 35.73 34.32 47.62 34.05

-8.84 -19.25 -45.59 35.73 -3.91 47.62 24.67 4.35 33.07

16.98 12.26 48.28 18.21 13.64 24.55 -27.49 15.20 22.46

42.54 -31.38 13.24 -2.93 32.93 -43.24 14.54 3.67 31.75

28.52 7.30 4.89 8.87 34.32 30.84 34.05 21.26 13.51

-8.84 -31.38 -45.59 -2.93 -3.91 -43.24 -27.49 0.00 0.00

42.54 12.26 48.28 35.73 34.32 47.62 34.05 0.00 0.00

-2

Input the number of rows: 4

Input the number of columns: 6

39.25 -12.80 -34.89 -16.90 -35.06 2.98

-22.59 -28.80 18.24 -0.13 -24.86 -5.65

10.07 -20.65 46.10 -12.93 15.35 -8.27

-34.79 39.51 -11.30 -5.25 -20.99 -12.25

-9.57 27.91

-10.63 18.14

4.94 24.40

-7.51 25.21

-34.79 -28.80 -34.89 -16.90 -35.06 -12.25

39.25 39.51 46.10 -0.13 15.35 2.98

39.25 -12.80 -34.89 -16.90 -35.06 2.98 -9.57 27.91

-22.59 -28.80 18.24 -0.13 -24.86 -5.65 -10.63 18.14

10.07 -20.65 46.10 -12.93 15.35 -8.27 4.94 24.40

-34.79 39.51 -11.30 -5.25 -20.99 -12.25 -7.51 25.21

-34.79 -28.80 -34.89 -16.90 -35.06 -12.25 0.00 0.00

39.25 39.51 46.10 -0.13 15.35 2.98 0.00 0.00

-3

Input the number of rows: 10

Input the number of columns: 3

-8.94 17.13 -3.44

26.15 -4.29 -42.11

-45.74 -40.49 -39.88

28.28 -1.89 -2.39

-24.48 48.97 14.12

27.19 -22.71 39.82

-9.16 -48.55 -25.53

-33.09 -27.49 30.58

26.27 -28.19 16.30

-16.88 46.06 -48.00

1.58 13.74

-6.75 34.20

-42.04 3.22

8.00 17.56

12.87 36.74

14.77 33.06

-27.75 19.79

-10.00 35.25

4.80 29.00

-6.27 47.92

-45.74 -48.55 -48.00

28.28 48.97 39.82

-8.94 17.13 -3.44 1.58 13.74

26.15 -4.29 -42.11 -6.75 34.20

-45.74 -40.49 -39.88 -42.04 3.22

28.28 -1.89 -2.39 8.00 17.56

-24.48 48.97 14.12 12.87 36.74

27.19 -22.71 39.82 14.77 33.06

-9.16 -48.55 -25.53 -27.75 19.79

-33.09 -27.49 30.58 -10.00 35.25

26.27 -28.19 16.30 4.80 29.00

-16.88 46.06 -48.00 -6.27 47.92

-45.74 -48.55 -48.00 0.00 0.00

28.28 48.97 39.82 0.00 0.00

EC.

-I have started the extra credit however I am very stumped and have allocated a lot of time to no avail, I am going to either try it again after I finish my other work, or wait to ask you about it during office hours then submit it with its runs separately