

Math 206 - Quiz 4

March 5, 2014

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (2.5 points) Design a simulation that could be used to estimate the solution of the following problem.

Collectors estimate that the probability of getting a rare Cyclops Bean in a single package of Mighty Beanz is 0.10. If a collector buys 7 packages, what is the probability that the collector gets two or more Cyclops Beans?

Perform ten trials of your simulation and use your results to estimate the probability.

USE THE RESEARCH RANDOMIZER TO GENERATE 10 SETS OF 7 NON-UNIQUE NUMBERS RANGING FROM 0 TO 9.

LET 0 REPRESENT A CYCLOPS BEAN. A ZERO IN A GROUP OF 7 NUMBERS MEANS A CYCLOPS WAS OBTAINED. TWO ZEROS IN A SINGLE GROUP OF 7 IS A SUCCESS (I.E. TWO OR MORE CYCLOPS BEANS).

RESULTS OF THE RR ARE ATTACHED. THERE WERE NO SUCCESSES IN 10 TRIALS

$$\text{Prob} \approx \frac{0}{10} = 0.$$

RESEARCH RANDOMIZER

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Research Randomizer Results

10 Sets of 7 Non-unique Numbers Per Set

Range: From 0 to 9 -- Sorted from Least to Greatest

Job Status: **Finished**

Set #1:

0, 3, 3, 5, 7, 8, 9

Set #2:

1, 2, 3, 3, 5, 6, 7

Set #3:

5, 5, 7, 8, 8, 9, 9

Set #4:

1, 1, 2, 3, 5, 8, 8

Set #5:

1, 2, 2, 3, 3, 5, 8

Set #6:

0, 2, 3, 4, 6, 6, 6

Set #7:

1, 2, 3, 8, 8, 9, 9

Set #8:

2, 3, 4, 5, 8, 8, 9

Set #9:

2, 3, 5, 6, 7, 7, 9

Set #10:

0, 1, 4, 4, 8, 8, 9

2. (2.5 points) Design a simulation that could be used to estimate the solution of the following problem.

What is the probability that in a group of five people chosen at random, at least two will have birthdays in the same month?

Perform ten trials of your simulation and use your results to estimate the probability.

USE THE RESEARCH RANDOMIZER TO GENERATE

10 SETS OF 5 NON-UNIQUE NUMBERS

RANGING FROM 1 TO 12.

5 NUMBERS PER SET (ONE TRIAL)

CORRESPOND TO THE BIRTH MONTHS
OF THE SELECTED PEOPLE.

FOR EXAMPLE,

6, 7, 1, 3, 7 MEANS THE

FIVE PEOPLE HAD BIRTHDAYS

IN JUNE, JULY, JAN, MAR, JULY,

RESPECTIVELY.

RESULTS OF THE RR ARE ATTACHED.

5 TRIALS PRODUCED DUPLICATE

BIRTH MONTHS.

$$\Rightarrow \text{Prob} \approx \frac{5}{10}$$

RESEARCH RANDOMIZER

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Research Randomizer Results

10 Sets of 5 Non-unique Numbers Per Set

Range: From 1 to 12 -- Unsorted

Job Status: **Finished**

Set #1:

5, 2, 12, 4, 5

Set #2:

4, 4, 2, 10, 6

Set #3:

1, 10, 6, 5, 7

Set #4:

3, 9, 1, 4, 1

Set #5:

8, 7, 10, 12, 4

Set #6:

6, 11, 1, 9, 12

Set #7:

11, 10, 1, 3, 7

Set #8:

10, 11, 11, 9, 10

Set #9:

10, 8, 3, 1, 5

Set #10:

5, 8, 10, 8, 4
