Stat 101L: Lecture 17

Randomness

- It's not easy being random.
  - Pick a number, either 1, 2 or 3, at random. Write this number down as your first digit.
  - Pick a number, either 1, 2 or 3, at random. Write this number down as your second digit.

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Trying to be Random

Second Digit

First Digit	1	2	3	Total
1				
2				
3				
Total				

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Random using JMP

Second Digit

First Digit	1	2	3	Total
1	12	14	14	40
2	9	13	8	30
3	11	10	9	30
Total	32	37	31	100

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Randomness

- Why do we need randomness?
  - We use randomness in our data collection to give a fair and accurate picture of the world.
  - Drawing conclusions from data relies on using randomness in data collection.

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Practical Randomness

- We can also use randomness to simulate outcomes that model a random situation.
- The Pick 3 Lottery.
  - Pay $1.
  - Pick 3 numbers between 0 and 9, say 123.
  - If the 3 numbers drawn match your numbers in any order you win $100.

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Simulation

- Component repeated – a random three digit number.
- Explain model – if number generated is 123, 132, 213, 231, 312 or 321 you win $100.
- Use JMP – Random Integer[1000]

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Simulation

- Response variable – number of wins in 1000 plays.
- Run several trials.
- Analyze the response variable.
- State your conclusion.

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Simulation

Trial	Wins	Gain/Loss
1	7	$300 loss
2	5	$500 loss
3	5	$500 loss
4	2	$800 loss
5	5	$500 loss
6	7	$300 loss

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Simulation

- Conclusion
  - Play the Pick 3 Lottery and you will end up losing money!

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