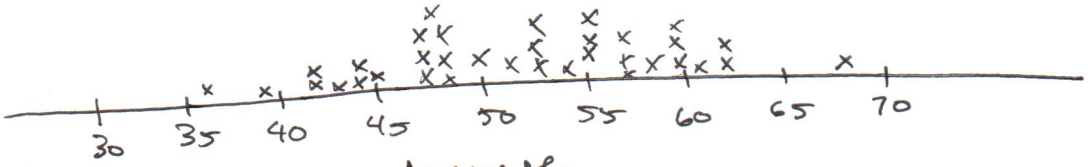
1. a. STATE: What is the probability that 15 honest subjects would roll an avg of at least 70 when rolling 2 ten-sided dice, assuming the first die represents the tens digit and the second die represents the ones digit?

PLAN: Using Table D, select 15 pairs of digits to form a number from 01 to 100 (let 00 = 100). Calculate and record the avg of these 15 numbers.

DO: There is an example of 1 trial, using line 101:

19, 22, 39, 50, 34, 05, 75, 62, 87, 13, 96, 40, 91, 25, 31 → average = 45.9

Here are the results of ~50 trials:



CONCLUDE: Because none of the 50 trials resulted in an avg of at least 70, the probability that 15 honest subjects would have a mean of at least 70 is approx. 0. Because getting a mean of 70 is very unlikely to happen by chance alone, there is good evidence that at least some of the subjects were lying.

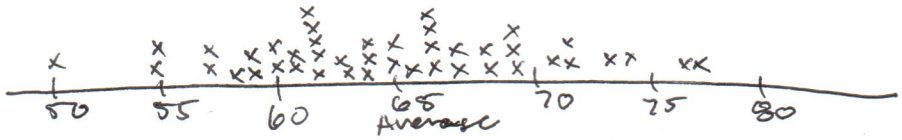
b. STATE: What is the probability that 15 honest subjects would roll an avg of at least 70 when rolling 2 ten-sided dice, assuming the die roll is used for the tens digit and the smaller roll is used for the ones digit?

PLAN: Using Table D, select 15 pairs of digits to form a number from 01 to 100, letting the larger digit represent the tens digit and the smaller digit represent the ones digit (letting 00 = 100). Calculate and record the average of these 15 numbers.

DO: example of one trial, using line 101.

91, 22, 93, 50, 43, 50, 75, 62, 87, 31, 96, 40, 91, 52, 31 → average = 60.9

Here are the results of ~50 trials:



CONCLUDE: Because 7 of the 50 trials resulted in an avg of at least 70, the probability that 15 honest subjects would have a mean of at least 70 is approx. 14%. Because getting a mean of 70 is somewhat likely to happen by chance alone, there is not good evidence that some of the subjects were lying.

2. a. HH, HT, TH = success ; TT = failure
b. 1, 2, 3 = success ; 4 = failure ; 5, 6 = ignore
c. 0, 1, 2 = success ; 3 = failure ; 4-9 = ignore
d. ♡, ◇, ♤ = success ; ♧ = failure

3. What is the probability this couple will have a girl?
$P(G) = \frac{1}{2}$ $P(B) = \frac{1}{2}$ Assign even digits = girl; odd digits = boy
Gender is independent
Select one # at a time from the table, repeats ok.
Stop at one even or 4 odd numbers.

10 trials: 1(9) 2(63) 3(07) 4(8240) 5(1) 6(9) 7(267) 8(9) 9(5) 10(45)
one girl 2b, 1g 1b, 1g 4b 1g 1g 2b 1g 1g 1b, 1g

9/10 chance this couple will have a girl, based on this simulation.

4. a. Assign 01-52 where 01-13 = ♡, 14-52 are not hearts.

b. No repeats. Stop at 2. 2-digit numbers between 01 and 52.
Generate numbers w/ calculator

Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	
33, >50	17, 14	46, 23	23, 15	39, 29	etc...
-$1	+$1	-$1	-$1	-$1	

5. a. hit: 00-31
no hit: 32-99
Repeats Ok.

b. 20 trials: [I am using the table @ the bottom of this page]
72 74 91 33 47 65 03 02 61 28 49 06
70 29 04 49 95 37 46 74
6 hits out of 20, or 0.3 or 30%

c. This simulation has a batting avg of 0.3 & actual batting avg is 0.320. My simulation is very close to actual value.

FRAP prep - old AP problems

3. a. Assign each coupon a 2-digit number from 01-50.

01-05 => $200
06-20 => $100
21-50 => $50

Select 2-digit #s from the random number table. until the value is equal to or greater than $300. Skip repeats (so no person can win more than once in a week).

b. week 1

33, 47, 03

$50 + $50 + $200 = $300

3 winners

week 2

02, 22, 49

$200 $50 ~~$50~~ = $300

2 winners

week 3

06, 29, 04

$100 + $50 + $200 = $350

3 winners