2.1 a.False

b. False

c. True

2.2 a. 18/38 = 9/19

b. 18/38 = 9/19

c. There are equally likely chances of red slot in every spin.

2.3 a. 10 – Fewer tosses means there will be more variation in proportion of head.

b. 100 – More tosses means the proportion will be close to average i.e. 0.50, greater than 0.40.

c. 100 - More tosses means the proportion will be close to average i.e. 0.50, greater than 0.40.

d. 10 - Fewer tosses means there will be more variation in proportion of head.

2.4 Probability for getting 6 or 3 in two dice rolls is equal i.e.1/36.

2.5 a. (1/2)^10

b. (1/2)^10

c. 1-P(no tails)

Graphical user interface, table

Description automatically generated

2.6 a.0

b. 4/36

c. 1/36

2.7 a. No because 11% of voters are identified both as swing and independent.

b. Independent Both Swing

0.35 0.11 0.23

c. 24% are only independent

d. 47% are either Independent or Swing

e. 1-0.47 =0.53

f. No

2.8 a. No since there 4.2% people who fall into both categories.

b. Below PL Both Foreign Lang

10.4 16.5

4.2

c. 10.4%

d. 31.1%

e. 100-31.1 = 68.9

f. No.

2.9 a. disjoint

b. Not disjoint as study pattern can be related.

c. No they should be independent.

2.10 a. ¾ \* ¾ \* ¾ \* ¾ \* ¼

b. ¼ \* ¼ \* ¼ \* ¼ \* ¼

c. 1-(¼ \* ¼ \* ¼ \* ¼ \* ¼)

2.11 a. 0.16 + 0.09 = 0.25

b. 0.17 + 0.09 = 0.26

c. 0.25 \* 0.26 = Assumption- That man and woman will marry each other independent of their bachelor’s degree.

d. Yes it’s reasonable.

2.12 a. 1- (0.25 + 0.15 + 0.28) = 0.32

b. 0.25

c. 0.25 + 0.15 + 0.28 = 0.68

d. Assump – Children do not take a leave by seeing the other one. 0.32 \* 0.32

e. 0.68 \* 0.68

f. Yes made an assumption but it may not be reasonable because siblings tend to take a leave by seeing each other.

2.13 a. This is incorrent as sum of all probabilities is greater than 1.

b. This is valid as sum, is equal to 1.

c. This is invalid, as sum is <1.

d. This is invalid as probability for F is negative.

e. This is valid as sum = 1.

f. This is invalid as pro for B is negative.

2.14 a. 459/4657

b. 4657/20000 + 2534/20000

2.15 a. No

b. 0.3 \* 0.7

0.3 + 0.7 – (0.21) = 1-0.21 = 0.79

P(a and b) / P(b) = 0.21/0.7 = 0.3

c. No because 0.3\*0.7 = 0.21 not equal to 0.1

d. P(A|B) = P(A and B)/P(B) = 0.1/0.7 = 1/7

2.16 a. 0.80 – peanut butter 0.89 – jelly 0.78-both

P(Butter) = 0.80 P(jelly) = 0.89 P(butter and jelly) = 0.78

P(jelly | butter) = P(jelly and butter)/P(butter) = 0.78/0.80=0.975

2.17 a. NO, because they have no dependence on each other so they are mutually exclusive.

b. P(Earth Warming or Liberal Demo) = P(Warming) + P(Liberal) – P(Warming and Liberal)

= 0.60 + 0.20 – 0.18

= 0.62

c. P(Earth Warming | Lib Demo) = P(Warming and Lib Demo)/P(Lib Demo)

= 0.18/0.20 = 0.9

d. P(Earth Warming | Cons Rep) = P(Warming and Cons Rep)/P(Cons Rep)

= 0.11/0.33 = 0.33

e.

f. P(moderate/liberal Republican

| not warming) = P( lib Rep and not Warming)/P(not Warming)

= 0.06/0.34 = 0.176

2.18 a.No because 20% of the people have excellent health status and have health coverage.

b. 0.2329

c. P( EHS | HC Yes) = P(Excellent health status and HC yes) / P(HC Yes)

= 0.2099/0.8738

= 0.240

d. P(EHS | HC No) = P( EHS and HC No) / P(HC No)

= 0.0230/0.1262

= 0.1822

e. No, as having health coverage does give information about the health status of people.

2.19. No because 6 female like five guys burger.

b. 162/248

c. 181/252

d. Suppose the male and female who come together to restaurant are dating.

e. P(Umami) + P(female) = P(Umami) + P(female) – P(Umami and female)

= 6/500 + 252/500 – 1/500

= 257/500

2.20 a. P ( M B ) + P( F B ) = P (M B) + P(F B) – P(F and B)

= 114/204 + 108/204 – 78/204

= 0.70

b. 78/114

c. 19/54 11/36

d. No, as the numbers are high for partners with same eye color.

2.21 a. b. 0.84

2.22 0.6048

2.23 By rounding up to 2 the answer is 0.811

2.24 0.4867

2.25 92.8 % chance that test is positive but patient doesn’t have lupus so house may be right.

2.26 0.461

**2.27** a. 5R 3B 2O

3/10 = 0.3

b. 0.3

c. 2/10 – O 3/10 – B

0.3

d. 0.3 \* 0.3 = 0.09

e. Yes the draws are independent because the sample space remains same.

2.28 a. 4B 5G 3B

a. 4/12 \* 3/11

b. 7/12 \* 6/11

c. 1 – P(no black sock) = 1 – (9/12 \* 8/11)

d. 0

e. 4/12 \* 3/11 + 5/12 \* 4/11 + 3/12 \* 2/11

2.29. 5r 3b 2o

A. 2/9

B. 3/9

C. 3/10 \* 2/9

d. No the draws are not independent because the sample space changes after first draw.

2.30 a. 28/95 \* 59/67 = 1652/8930 = 0.18

b. 72/95 \* 28/94 = 2016/8930 = 0.22

c. 72/95 \* 28/95 = 2016/9025=0.223

d. In b the sample space changes after the first draw, whereas in the second draw the sample space remains unchanged. Large sample.

2.31 7 – jeans 4 – shorts 8- skirts 5-leggings

5/24 \* 7/23 \* 6/23

3 ways these clothings can be drawn.

2.32