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MATH BRIDGE
WEEK 1 ASSIGNME

2.12 School absences

25% students miss 1 day = .25
15% students miss 2 days = .15
~~28~~ 28% students miss 3+ days = .28

(a) probability of a random student not missing any days

1 - (P(missing 1day) + P(missing 2days) + P(missing 3+ days

1 - (.25 + .15 + .28) = 1 - .68

= 0.32

(b) probability of missing no more than 1 day

1 - (P(missing 2days) + P(missing 3+ days)

1 - (.15 + .28) = 1 - .43

= 0.57

(c) probability of missing at least one day

$= .25 + .15 + .28 = 0.68$

$P(\text{missing 1 day}) + P(\text{missing 2days}) + P(\text{missing 3+days})$

(d) 2 kids in school, probability neither misses one day

- these are independent events; no family vacation
- probability of not missing 1 day $= \underline{0.32}$ from (a)

$P(\text{2 kids not missing}) = P(\text{Kid1}) \times P(\text{Kid2})$

$= 0.32 \times 0.32$

$= .1024$

(e) 2 kids, probability of missing at least one day

- independent events; no family vacation
- probability of missing at least oneday $= 0.68$ from (c)

$P(\text{2 kids missing at least 1 day}) = P(\text{Kid1 missing}) \times P(\text{Kid2 missn}$

$= 0.68 \times 0.68$

$= .4624$

deficiencies. [illegible]

(f) assumption that an event that would keep both kids out of school, such as a family vacation, did not happen. This seems reasonable since not all families take vacation during the school year, instead going over the summer.

2.14 Weight and Health Coverage

(a) probability overweight & no health coverage

$$\frac{15,327}{428,638} = .036$$

(b) $P(\text{overweight}) = \frac{157,026}{428,638}$

$P(\text{no health care}) = \frac{44,837}{428,638}$

$$\frac{157,026}{428,638} + \frac{44,837}{428,638} - \frac{15,327}{428,658} = \frac{186,536}{428,638}$$

$$= .436$$

2.28 Socks in a drawer

* without replacement

4 blue $\frac{4}{12}$
5 gray $\frac{5}{12}$
3 black $\frac{3}{12}$

total = 12 socks

(a) 2 blue socks

$$\frac{4}{12} \times \frac{3}{11} = \frac{12}{132} = \frac{1}{11} = .09$$

(b) no gray socks

$$P(\underset{\text{draw 1}}{\text{blue sock or black sock}}) \times P(\underset{\text{draw 2}}{\text{blue or black sock}})$$

$$\frac{7}{12} \times \frac{6}{11} = \frac{42}{132} = \frac{7}{22} = .32$$

(c) at least 1 black sock

$$P(\text{no black sock}) = \frac{9}{12} \times \frac{8}{11} = \frac{72}{132} = \frac{6}{11} = .55$$

using complement:

$$1 - .55 = .45$$

deficiencies. [illegible]

(d) a green sock

0 - there are no green socks

(e) matching socks

P(2 blue) + P(2 gray) + P(2 black)

$P(2\text{ blue}) = \frac{4}{12} \times \frac{3}{11} = \frac{1}{11}$ $\frac{12}{132}$

$P(2\text{ gray}) = \frac{5}{12} \times \frac{4}{11} = \frac{20}{132} =$

$P(2\text{ black}) = \frac{3}{12} \times \frac{2}{11} = \frac{6}{132}$

$\frac{12}{132} + \frac{20}{132} + \frac{6}{132} = \frac{38}{132} = .287$

2.30 Books on a bookshelf

(a) $P(\text{hardcover, book}) = \frac{28}{95}$

$P\left(\begin{matrix}\text{paperback}\\\text{fiction}\\\text{book2}\end{matrix}\right) = \frac{59}{94}$

$\frac{28}{95} \times \frac{59}{94} = \frac{1652}{8930} = .18$

(b) $P(\text{fiction book1}) = \frac{72}{95}$

$P(\text{harcover book 2}) = \frac{28}{94}$

$\frac{72}{95} \times \frac{28}{94} = \frac{2016}{8930} = .23$

(c) $P(\text{fiction book}) = \frac{72}{95}$ * without replacement

$P(\text{hardcover book}) = \frac{28}{95}$

$\frac{72}{95} \times \frac{28}{95} = \frac{2016}{9025} = .22$

(d) Little impact seen because of the larger population of books in this example, specifically the difference between n=94 vs. n=95. Adding the book back did not meaningfully change the probability.