Assignment 7 Part 1

David Yan

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9.2 -11c How many bit strings of length 8 begin and end with 1's

The first and last bit must be 1 that means that there is 6 positions with a possibility of either being a 1 or 0

$1 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 1 = 2^6 = 64$

9.2 -14c Suppose that in a certain state, all automobiles license plates have four letters followed by 3 digits

How many license plates could begin with TGIF?

The first 4 steps have only one option each. The last 3 can be any digit

$1 \cdot 1 \cdot 1 \cdot 1 \cdot 10 \cdot 10 \cdot 10 = 1000$

e How many license plates could begin with AB and have all letters and numbers distinct

The first 2 letters must be A the B. This leaves 24 and 23 letters remaining followed by 10, 9, and 8 numbers.

$1 \cdot 1 \cdot 24 \cdot 23 \cdot 10 \cdot 9 \cdot 8 = 253,440$

9.2 - 17 a How many integers are there between 1000 and 9999

$9 \cdot 10 \cdot 10 \cdot 10 = 9000$

b How many odd integers are there between 1000 and 9999

$9 \cdot 10 \cdot 10 \cdot 5$ (1, 3, 5, 7, 9 are the 5 options) $= 4500$

c How many integers from 1000 to 9999 have distinct digits

$9 \cdot 8 \cdot 7 \cdot 6 = 3024$

d How many odd integers have distinct digits

$6 \cdot 3 \cdot 4 \cdot 5 = 360$

↖ since the first digit can't be 0, digit 2, digit 3, or digit 4

e Probability that it has distinct digit? is odd?

3024/9000 , 360/9000

9.3 · 5 a How many 5 digit integers are divisible by 5?

$9 \cdot 10 \cdot 10 \cdot 1 = 900$ same applies for numbers that end in 5

↑ numbers that can end in 0

$900 + 908 = 1800$

b Probability that a randomly chosen number is divisible by 5

9.2-17 a established 9000 ints

1800 / 9000 = 2/10

9.3 - 24 a How many int between 1 and 1000 are divisible by 2 or 9

Probability of 2 = 2k where k = 1 to 500
Probability of 9 = 9n where n = 1 to 111
Probability of 18 = 18m where m = 1 to 55

$N(A \cup B) = N(A) + N(B) - N(A \cap B)$

$500 + 111 - 55$

556

b What is the probability that a number is divisible by 2 or 9

$1 \cdot 10 \cdot 10 \cdot 10 = 1000 = 556/1000$

c What is the probability that it is not divisible by 2 or 9

$1000 - 556 = 444/1000$

9.3 - 33 e

28	checked	1	$N(H)$
26	checked	2	$N(C)$
14	checked	3	$N(D)$
8	checked	1 & 2	$N(H \cap C)$
4	checked	1 & 3	$N(H \cap D)$
3	checked	2 & 3	$N(C \cap D)$
2	checked	1, 2, & 3	$N(H \cap C \cap D)$

How many checked #2 and #3 but not #1

$N(C \cap D) - N(H \cap C \cap D) = 3 - 2 = 1$

f How many checked #2 but neither of the other 2 options

$N(C) - N(H \cap C) - N(C \cap D) - N(H \cap C \cap D)$

$26 - 8 - 3 - 2 = 13$