

STA1013 : Practice Problems for Quiz 3

November 6, 2019

1 Standard Normal distribution

1. X follows normal distribuion $N(\mu = 50, \sigma = 5)$. Calculate the Z scores of the followings

(a) $x = 45$

(a) _____

(b) $x = 50$

(b) _____

(c) $x = 60$

(c) _____

2. Find the critical values

(a) $z_{0.025}$

(a) _____

(b) $z_{0.05}$

(b) _____

3. Z follows standard normal distribution $N(0, 1)$. Find z

(a) $P(|Z| \leq z) = 0.9$

(a) _____

(b) $P(|Z| \geq z) = 0.05$

(b) _____

2 Central Limit Theorem

1. X follows distribution $\mu = 5, \sigma = 3$, and we draw random samples with size 100. What is sampling distribution of \bar{X} ?

1. _____

3 Probability

1. Assume that a fair coin is tossed three times.

(a) Find the probability that at least one head is obtained.

(a) _____

(b) Find the probability that all three tosses have the same outcome.

(b) _____

(c) Find the probability that the first and third tosses have the same outcome.

(c) _____

2. Two dice are tossed.

(a) Find the probability of getting a sum of 8

(a) _____

(b) Find the probability of getting a sum of at least 8

(b) _____

(c) Find the conditional probability of getting a sum of 8 given getting a sum of at least 8

(c) _____

(d) Find the probability of getting a “double”

(d) _____

(e) Find the probability that the outcome is NOT a double

(e) _____

(f) Find the probability of getting a sum of 8 OR a double

(f) _____

3. A large car dealership examined a sample of vehicles sold or leased in the past year. Data is classified by type (**car, SUV, van, truck**) and by whether they were a sale of a **new** or **used** vehicle or whether the vehicle was **leased**.

	Car (C)	SUV (S)	Van (V)	Truck(T)	Total
New vehicle sale (N)	86	25	21	38	170
Used vehicle sale (U)	39	13	4	22	78
Vehicle Lease (L)	34	12	6	0	52
Total	159	50	31	60	300

(a) Find the probability that the vehicle was leased.

(a) _____

(b) Find the probability that a vehicle was NOT a van.

(b) _____

(c) Find the probability that the vehicle was a van AND was leased.

(c) _____

(d) Find the probability that the vehicle was a van OR was leased.

(d) _____

(e) Find the probability that a vehicle was used IF (given that) it was a van.

(e) _____

(f) Find the probability that the vehicle was a van IF (given that) it was used.

(f) _____

(g) Are events a van and new mutually exclusive?

(g) _____

4. Use the table given below to answer questions.

x	1	2	4
$P(X = x)$	$\frac{1}{2}$	$\frac{2}{8}$	$\frac{2}{8}$

(a) Find the expectation $E(X)$ of the given probability dist

(a) _____

(b) Find the variance $\text{Var}(X)$ of the given probability dist

(b) _____

5. Problems in Lecture note 20 ~ 22

4 Binomial distribution

1. Problems in Lecture note 23