

Trainee Program -- March

Task 1

Statistics

Q1. Given two fair dices, what is the probability of getting scores that sum to 4? to 8?

Q2. Suppose that diastolic blood pressures (DBPs) for men aged 35–44 are normally distributed with a mean of 80 (mm Hg) and a standard deviation of 10. What is the probability that a random 35–44-year-old has a DBP less than 70?

Q3. In a population of interest, a sample of 9 men yielded a sample average brain volume of 1,100cc and a standard deviation of 30cc. What is a 95% Student's T confidence interval for the mean brain volume in this new population?

Q4. The average breaking strength of steel rods is specified to be 18.5 thousand pounds with standard deviation of 1.955. A sample of 14 rods were tested, the mean strength was 17.85 thousand pounds. Is this result significant?

Note: Use hypothesis testing Concept

Q5. A factory produces bolts with an average diameter of 21 mm. A random sample of 25 bolts has a mean diameter of 22.6 mm and standard deviation 3 mm. Can we assume the sample has been drawn from the population at 5% level of significance.

Q6. The blood groups of 200 people are distributed as follows: 50 have type A blood, 65 have type B blood, 70 have type O blood type and 15 have AB type blood. If a person from this group is selected at random, what is the probability that this person has O blood type?

Q7. A box contains 90 discs numbered 1 to 90. One disc is drawn at random from the box. What is the probability that it bears

- a. a two-digit number
- b. a perfect square
- c. a multiple of 5

d. a number divisible by 3 and 5.

Q8. A newly developed muesli contains five types of seeds (A, B, C, D and E). The percentage of which is 35%, 25%, 20%, 10% and 10% according to the product information. In a randomly selected seed, the following volume distribution was found.

Component	A	B	C	D	E
Number of Pieces	184	145	100	63	63

Let us decide about the null hypothesis whether the composition of the sample corresponds to the distribution indicated on the package at $\alpha = 0.1$ significance level.

Q9. Can a dice be considered regular which is showing the following frequency distribution during 1000 throws?

Thrown Value	1	2	3	4	5	6
Frequency	182	154	162	175	151	176