

These questions were covered in details during the discussion sections.

1. A store is faced with taking one of the following 3 actions:
 - (a) a_1 : increase sales force by 10%
 - (b) a_2 : maintain current sales force
 - (c) a_3 : decrease sales force by 10%

Depending on the future state of the economy, good (θ_1), bad (θ_2), terrible (θ_3), the store will face losses depending on the action it takes. Note that a negative loss implies a profit. The company

	a_1	a_2	a_3
θ_1	-10	-5	-3
θ_2	-5	-5	-2
θ_3	1	0	-1

believes that θ has the probability distribution $\xi(\theta_1) = 0.2$, $\xi(\theta_2) = 0.3$, and $\xi(\theta_3) = 0.5$. Order the actions according to their prior expected loss and state the action that should be taken.

2. Suppose θ is the probability of getting tails when flipping a coin. Your knowledge tells you that θ can only be equal to 0.25, 0.50 or 0.75. As an experiment, you flip a coin 10 times and obtained 6 tails. What is the maximum likelihood estimator (MLE) of θ ?
3. In a clinical trial, let the probability of successful outcome θ have a prior distribution that is the uniform distribution on the interval $[0, 1]$. Suppose that the first patient has a successful outcome. Find the Bayes estimator of $\theta(1 - \theta)$ under the squared error loss.
4. Suppose that X_1, \dots, X_n form a random sample from an exponential distribution for which the value of the parameter β is unknown. Find the MLE of $\sqrt{\beta}$.
5. Suppose that X_1, \dots, X_n form a random sample from a normal distribution for which the value of the parameters μ and σ^2 are unknown. Find the MLE of μ and σ^2 .