

Quiz# 6

Name:

ID #:

Section:

Q1: You are given the following information about six coins:

| Coin | Probability of Heads |
|-------|----------------------|
| 1 – 4 | 0.50 |
| 5 | 0.25 |
| 6 | 0.75 |

A coin is selected at random and then flipped repeatedly. X_i denotes the outcome of the i th flip, where “1” indicates heads and “0” indicates tails. The following sequence is obtained:

$$S = \{X_1, X_2, X_3, X_4\} = \{1, 1, 0, 1\}$$

Determine $E[X_5 | S]$ using Bayesian analysis

Q2: An insurer writes a large book of home warranty policies. You are given the following information regarding claims filed by insureds against these policies:

- (i) A maximum of one claim may be filed per year.
- (ii) The probability of a claim varies by insured, and the claims experience for each insured is independent of every other insured.
- (iii) The probability of a claim for each insured remains constant over time.
- (iv) The overall probability of a claim being filed by a randomly selected insured in a year is 0.10.
- (iv) The variance of the individual insured claim probabilities is 0.01.

An insured selected at random is found to have filed 0 claims over the past 10 years.

Determine the Bühlmann credibility estimate for the expected number of claims the selected insured will file over the next 5 years.