

Bayes Coins A

We have a bag of old coins in different phases of wearing out; coins of the same values can have different size. The value of coins is readable. We have to sort the coins in the bag by their value. We know that there are coins with value of 1, 2 and 5 crowns. For the loss function, we decided to use: $l(s,d) = |hd-hs|$ where hs is the value of the coin and hd is our decision (classification) about the value of the coin.

We have at our disposal a weighing machine, which weights with a 5 gram precision. We will try to estimate the weight of individual values of coins based on experiment. We will randomly choose 100 coins, weight them and write down their values. We will create a training dataset. After the weighing of the training dataset, we get this table:

s/x	5 g	10 g	15 g	20 g	25 g	Suma
1 CZK	8	12	4	7	0	31
2 CZK	7	3	9	8	4	31
5 CZK	2	3	6	10	17	38
Suma	17	18	19	25	21	100

P(s,x)	5 g	10 g	15 g	20 g	25 g	Suma
1 CZK	0.08	0.12	0.04	0.07	0.0	0.31
2 CZK	0.07	0.03	0.09	0.08	0.04	0.31
5 CZK	0.02	0.03	0.06	0.1	0.17	0.38
Suma	0.17	0.18	0.19	0.25	0.21	1

- How many strategies are there?
- We have found a new coin with a weight of 20 grams. Into which class will you put this coin? write down your calculation.