

EXAM C QUESTIONS OF THE WEEK

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Week of April 17/06

Type A risks have each year's losses uniformly distributed on the interval $(0, 1)$.

Type B risks have each year's losses uniformly distributed on the interval $(0, 2)$.

A risk is selected at random, with each type being equally likely. The first year's losses equal L .

Find the Buhlmann credibility premium for the second year's losses

in terms of L .

Solution can be found below.

Week of April 17/06 - Solution

Prior distribution is $P(A) = P(B) = \frac{1}{2}$.

Hypothetical means are $\mu(A) = E[X|A] = .5$, $\mu(B) = E[X|B] = 1$.

Process variances are $v(A) = Var[X|A] = \frac{1}{12}$, $v(B) = \frac{4}{12} = \frac{1}{3}$.

$\mu = E[X] =$ expected hypothetical mean $= (.5)(\frac{1}{2}) + (1)(\frac{1}{2}) = \frac{3}{4}$.

$v =$ expected process variance $= (\frac{1}{12})(\frac{1}{2}) + (\frac{1}{3})(\frac{1}{2}) = \frac{5}{24}$.

$a =$ variance of hypothetical mean $= (1 - .5)^2(\frac{1}{2})(\frac{1}{2}) = \frac{1}{16}$.

$Z = \frac{n}{n + \frac{v}{a}} = \frac{1}{1 + \frac{5/24}{1/16}} = .2308$.

Buhlmann credibility premium is

$ZL + (1 - Z)\mu = .2308L + .7692(\frac{3}{4}) = .2308L + .5769$