

Statistics XP84 - Quiz 3

NAME:

You have 15 minutes.
Each part of each question is worth 2 points.
There are two questions.

I pledge my honor that I have not violated the Honor Code
during this examination.

SIGNATURE:

1 Question

Suppose you can invest in a risk free asset which gives return .02 for sure, and two risky assets, R_1 and R_2 .

Your beliefs about R_1 and R_2 are summarized by

$$R_1 \sim N(.05, .1^2), \quad R_2 \sim N(.1, .15^2), \quad \rho_{R_1, R_2} = .8.$$

(the correlation between R_1 and R_2 is .8)

You put 50% of your wealth into the riskless asset, 30% into R_1 and 20% into R_2 so that the return on your portfolio is given by

$$\begin{aligned} P &= .5(.02) + .3 R_1 + .2 R_2 \\ &= .01 + .3 R_1 + .2 R_2 \end{aligned}$$

1.1

What is $E(P)$?

1.2

What is the covariance between R_1 and R_2 ?

1.3

What is $Var(P)$?

1.4

What is σ_p ?

2 Question

Suppose you take a random sample of 1,000 from a large population of voters.

It turns out the 550 of those sampled are democrats and 450 are republicans.

2.1

What is the 95% confidence interval for the true population proportion of democrats?

2.2

Suppose you would like to have a confidence interval for p with a \pm of .01.

How big a sample would you need to take?