MiniProject

Exercise on r

This Quarto document from r shows the exercise 19.

```
# Parameters
n_policies1=1000 # number of type 1 policies
n_policies2=1000 # number of type 2 policies

b1=1 # payout for type 1 policies
b2=2 # payout for type 2 policies

q1=0.01 # probability of death for type 1 policies
q2=0.05 # probability of death for type 2 policies

#Expected payouts for each policy type
E_X1=b1*q1
E_X2=b2*q2

#Variances for each policy type
Var_X1=b1^2*q1*(1 - q1)
Var_X2=b2^2*q2*(1 - q2)

#Total pure premium for the portafolio
pure_premium=n_policies1*E_X1 + n_policies2*E_X2

#Total variance for the portafolio
total_variance=n_policies1 * Var_X1 + n_policies2 * Var_X2
total_sd=sqrt(total_variance)

#CLT to find the required charge
z_value=qnorm(0.95)
```

```r
C=pure_premium + z_value*total_sd
C #133.2559
```

```
[1] 133.2559
```

```r
#Minimum charge percentage
charge_percentage=((C - pure_premium) / pure_premium) * 100
charge_percentage #21.14175
```

```
[1] 21.14175
```