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)  
C=pure\_premium + z\_value\*total\_sd  
C #133.2559

[1] 133.2559

#Minimum charge percentage  
charge\_percentage=((C - pure\_premium) / pure\_premium) \* 100  
charge\_percentage #21.14175

[1] 21.14175