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| 4. What would be the required sample size $n$ so that the standard error of $\bar{X}$ (i.e. $SD(\bar{X})$) would be 2 (or just under 2) for the following populations:  a. $Normal(1000, 10^2)$ 10^2 10^2 variance  b. $Pois(75)$ 75 lamda=75=variance  c. $Binom(200, .35)$ np(1−p) 200\*0.35(0.65)=variance  d. $exp(.05)$ 1/λ2 1/0.05^2 | σ/sqrt(n)=2 => sqrt(n)= σ/2 n=(σ/2)^2=σ^2/4 =var/4  Normal(1000, 10^2) n>=10^2/4=25  Poiss(75) n>=75/4=18.75 n>=19  Binom(200, .35) n>=200\*0.35(0.65)/4=11.375 n>=12  exp(.05 1/0.05^2/4=100 n>=100 |
| 3 zadaca komentar 4.c   1. **Interpretation**:  * The sample mean of Xbar has a much lower variance than S2 , making it more stable as an estimator in this case. * The combined estimator 0.5 Xbar +0.5 S2  has a variance of 15.71, which is higher than the variance of Xbar alone. This suggests that the combination does not improve stability compared to Xbar  alone, though it is more stable than S2   **Conclusion**: Xbar as an estimator due to its low variance compared to S2 or the combined estimator. ​ | Constructing linear combination of estimators Xbar  and S2 we want to have  unbiased estimator.  E(Xbar)= λ mean Poisson  E(S2)= λ variance Poisson  Unbiasedness: E(λbar)= λ  E(a Xbar +b S2)= a E(Xbar)+bE (S2)=a λ+b λ= λ  =>a+b=1  We can take a=0.5 b=0.5 |