Quiz Problem 1

Consider bagging B regression methods $\hat{f}_b$ for $b = 1, \ldots, B$ and let the bagged method be

$$\hat{f}(x) = \frac{1}{B} \sum_{b=1}^{B} \hat{f}_b(x).$$

Assume that the $\hat{f}_b(x)$ are all identically distributed from some distribution with mean zero and variance σ^2 and that the correlation among any of them is $\rho > 0$. What is the variance of $\hat{f}$? If we let ρ be negative can it be equal to -1? Find a lower bound for ρ.