Homework

1. Solve the infinite buffer model $V_i = \min\{(V_{i-1} + X_i - d)^+\}, i = 1, 2, \ldots$, in terms of $S_i = \sum_{k=1}^{i} X_k$, d, and i.

2. One test statistic used to estimate the Hurst parameter H is calculating the Index of Dispersion for Counts $IDC(t) = \frac{Var(A_t)}{E(A_t)}$, where the variance is usually calculated by dividing the whole series into nonoverlaping blocks of length t and treating them as different instances of A_t. With the help of the FBM model given, $A_t = nt + \sqrt{an}Z_t$, explain the theoretical idea behind the estimation of the Hurst parameter using IDC (How is H estimated using IDC?).