

1. How many calls does the following algorithm make to $f(i, j)$.

For $0 \leq i \leq n$ do

for $0 \leq j \leq i$ do $a[i, j] = f(i, j)$.

2. Approximate $\sum_{0 \leq i \leq n} 2^{i!}$.

3. Approximate $\sum_{1 \leq i \leq n} \frac{\ln i}{i}$.

4. Solve the recurrence $T_n = T_{n-1} + T_{n-3}$.

5. Suppose a problem of size n can be reduced to a problems of size n/A plus b problems of size n/B using an overhead of time $O(n^x)$. What is the asymptotic running time of an algorithm based on this division.