Problem 1: parts 2 and 3

T(n)=T(n-1)+n

T(n-1)=T(n-2)+n-1 T(n-2)=T(n-3)+2n-2

T(n)=T(n-3)+3n-3

.

.

.

=T(n-n)+n\*n-n

=T(0)+n\*n-n

=c+n^2-n

O(n^2)

Problem 2

logan=logbn

logbn=logan/logab 🡪 logab is a constant

logan/logab= logan\*(1/logab)= c\*logan

logbn=c\*logan

c\*logan<= logbn<= c\*logan

Problem 4:

best case

T(n)=2T(n/2)+cn T(n/2)=2T(n/4)+cn

T(n)=4T(n/4)+2cn

=8T(n/8)+3cn

.

.

.

=nT(n/n)+cn(log2n)

=n+cn(log2n)

O(nlog2n)

worst case

T(n)=T(n-1)+n

T(n-1)=T(n-2)+n-1 T(n-2)=T(n-3)+2n-2

T(n)=T(n-3)+3n-3

.

.

.

=T(n-n)+n\*n-n

=T(0)+n\*n-n

=c+n^2-n

O(n^2)