**Problem 2**

Proof: T(n) = nlogn

Base Case: T(2) = 2log2

2 = 2log2 hence, satisfied

Induction Hypothesis: Assume T(n) = is true for n=2k where k > 1

So, T(2k)= 2klog2k

Induction Step: showing that n=2k+1 holds where k > 1 and that,

T(2k+1)= 2k+1log2k+1 is true

From Induction hypothesis T(2k)= 2klog2k

Hence, proved T(n) =