CSC225: Lab 4

Big-Omega

A function $T(n)$ is in $\Omega(f(n))$ if there exists an integer n_0 and a constant $c > 0$ such that for all integers $n \geq n_0$, $T(n) \geq cf(n)$.

1. Prove that the function $T(n) = n^2$ is in $\Omega((n+1)^2)$.

2. Prove that the function $T(n) = n^2$ is in $\Omega(nlogn)$.

3. Prove that the function $T(n) = 2n^2 - 3n - 49$ is in $\Omega(n^2)$.

4. Prove that the function $T(n) = -5n + n^2$ is in $\Omega(n^2)$.

Big-Theta

A function $T(n)$ is in $\Theta(f(n))$ if there exists an integer n such that for all integers $n \geq n_0$, $T(n)$ is in $O(f(n))$ and $T(n)$ is in $\Omega(f(n))$.

1. Prove that the function $T(n) = (n+1)^2$ is in $\Theta(n^2)$.

2. Prove that the function $T(n) = bn + anlogn$ is in $\Theta(nlogn)$ for a,b are integer constants ≥ 0 .