CS 2312: Lab 04

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Prove or Disprove

For each of the following statements, prove whether they are true or false.

- $\forall f(n), g(n), f(n) \in O(g(n)) \lor g(n) \in O(f(n))$

- $f(n) \in O(g(n)) \Leftrightarrow g(n) \in \Omega(f(n))$

- $f(n) \in O(g(n)) \Rightarrow f(n) \in o(g(n))$

- $f(n) \in o(g(n)) \Rightarrow f(n) \in O(g(n))$

Big Theta Proof

$$\text{Prove that } 3n^2 + 100n \in \Theta(5n^2)$$

Big Omega Proof

Prove using induction that $n \log n \in \Omega(n)$

Code Analysis

Provide a running time analysis of the following loop:

```java
for(int i = 4; i < n; i = i*i) {
    for(int j = 2; j < Math.sqrt(i); j = j+j) {
        System.out.println("*");
    }
}
```

Solutions

[Lab 04 Solutions](Lab%2004%20Solutions)