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CSC 229 – Week 6 Assignment

*2) Discuss the following hypothesis: You cannot find two functions f(n) and g(n) where:*

**

The hypothesis is incorrect because you can find two functions under both conditions. Within the conditions, **f(n) = g(n)** and **f(n) = g(n)logn** are two functions that are within the lower and upper bounds.

*3) Find time complexity of the following recurrence*

**

T(n) = aT(n/b) + f(n)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a | b | f(n) | c | logba | k |
| 3 | 4 | 1 | 1 | 0.792 | 0 |

Case 3: c > logb­a

T(n) = O(f(n))

The time complexity of this function is **O(n)**.

*4) Find time complexity of the following recurrence*

**

T(n) = aT(n/b) + f(n)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a | b | f(n) | c | logba | k |
| 8 | 6 | √n | 0.5 | 1.16 | 0 |

Case 1: c < logb­a

T(n) = O(nlog­ba)

The time complexity of this function is **O(nlog68)**.

*5) Find time complexity of the following recurrence*



T(n) = aT(n/b) + f(n)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| a | b | f(n) | c | logba | k |
| 3 | 5/3 | 1 | 1 | 2.15 | 0 |

Case 1: c < logb­a

T(n) = O(nlog­ba)

The time complexity of this function is **O(nlog5/33)**.