

CMPT 225 - Big Oh

If f, g are functions $f: \mathbb{N} \rightarrow \mathbb{N}$, $g: \mathbb{N} \rightarrow \mathbb{N}$

f is $O(g)$ means there are constants n_0 , $c > 0$

such that

for every $n > n_0$, $f(n) \leq c \cdot g(n)$

The n_0 means that there are finitely many small values that don't matter, we care about the end behaviour

Asymptotic Notation (eg. Big-Oh)

Is not about algorithms

Is a tool for describing (growth of) functions

It is useful for describing functions related to algorithms + data structures

eg - minimum or maximum time/space taken

We use it so often for worst-case time for an algorithm that we often leave implicit a statement like "let $T(n)$ be the max time taken by algorithm A on an input of size at most n "

This statement is essential.