CSE 3101, Summer 2010

Tutorial 1

May 13, 2010

- 1. For the following functions f(), g(), f(n) = O(g(n)) or g(n) = O(f(n)) but not both. Determine which is true.
 - (a) $f(n) = n^2 + 3n + 4, g(n) = n^3.$
 - (b) $f(n) = 4n \log n + n, g(n) = (n^2 n)/2.$
- 2. Prove that $9999n + 635 = O(2^n)$.
- 3. Prove that the following algorithm for swapping two numbers is correct.
 - SWAP(x, y)1 // swap x and y 2 $x \leftarrow x + y$ 3 $y \leftarrow x - y$ 4 $x \leftarrow x - y$
- 4. Analyze the running time of the following algorithm (this was in homework 1).
 - POWER(y, z)1 // return y^z where $y \in R, z \in N$ 2 $x \leftarrow 1$ 3 while z > 04 do if odd(z)5 then $x \leftarrow x * y$ 6 $z \leftarrow \lfloor z/2 \rfloor$ 7 $y \leftarrow y^2$ 8 return x