CSC544 Assignment #4

due Tuesday 4/14 in class

version 1.0

Problems

1. Let $g(x, y, z)$ be a primitive recursive function. Show that the following functions are primitive recursive,

   (a) $f(x, y) = g(x, y, x)$

   (b) $f(x, y, z, w) = g(x, y, x)$

   (c) $f(x) = g(1, 2, x)$

2. Show that

$$max(x, y) = \begin{cases} x & \text{if } x \geq y \\ y & \text{otherwise} \end{cases}$$

   is primitive recursive.

3. Let $g(x) = x^2$ and $h(x, y, z) = x + y + z$ and let $f(x, y)$ be the function defined from g and h by primitive recursion. Compute the values $f(1, 0), f(1, 1), f(1, 2)$, and $f(5, 0), f(5, 1), f(5, 2)$.

4. The functions below were defined in Table 13.1. Explicitly give the functions g and h that make the definitions legal definitions as given in the definition for primitive recursive functions.

   (a) sg

   (b) sub

   (c) exp