Due: Friday October 16

1) Write register machine program to compute $\max(x, y)$.

2) Write a register machine program to compute

$$f(x, y) = \begin{cases} 0 & \text{if } y = 0 \\ \lfloor x/y \rfloor & \text{if } y \neq 0 \end{cases}$$

where $\lfloor r \rfloor$ is the greatest integer $\leq r$ for $r \in \mathbb{R}$.

3) a) Suppose $P(x, y)$ is a primitive recursive predicate and $g(x)$ is a primitive recursive function. Define $f(x) = 0$ if there is no $n \leq g(x)$ such that $P(x, n) = 1$. Otherwise $f(x)$ is the least $n \leq g(x)$ such that $P(x, n) = 1$. Prove that $f$ is primitive recursive.

   b) Prove that the function $f$ from problem 2 is primitive recursive.