Final project

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Algorithm:

Inputs: w ~ Unif(0,1)
$l_k(x^*) = log(g_l(x^*))$
$u_k(x^*) = log(g_u(x^*))$
$h(x^*) = log(g(x^*))$
$s_k(x) = exp(u_k(x))/\left(\int_D u_k(x')\,dx'\right) = g_u(x)/\left(\int_D g_u(x')\,dx'\right)$

Step 1: If $w < exp(l_k(x^*) - u_k(x^*))$
- Accept x^* when the condition is satisfied. Draw another x^* from $s_k(x)$
- Reject x^* when the condition is not satisfied.

Step 2: These two procedures can be done in parallel. - Evaluate $h(x^*), h'(x^*)$. Update $l_k(x), u_k(x), s_k(x)$, which are now include x^* as an element. - Accept x^* if $w < exp(h(x^*) - u_k(x^*))$. Otherwise, reject.

Example: Start with g(x) = 3*N(0,1).
g(x) = $\frac{3}{\sqrt{2\pi}} e^{-(x)^2/2}$

```
g <- function(x) {
  3*sqrt()
}
```