# Part 1

$W_t := W(t, \omega)$ a brownian motion. Discretize this and approximate as a random walk, then $dW_j := W(t_{j+1}, \omega) - W(t_j, \omega)$, $dW_j \in \{-h, +h\}$, with $t_j = h \cdot j$, $P(dW_j = +h) = P(dW_j = -h) = \frac{1}{2}$. Then $t_0 = 0$, $W_{t_k} = \sum_{j=1}^{k} dW_j$

Implementation:
Let $y_j = \{1 \text{ if } dW_j = +h, 0 \text{ if } dW_j = -h\}$, then $dW_j = 2h\, y_j - h$, $W_{t_k} = \sum_{j=0}^{k} (2h\, y_j - h) = -k \cdot h + 2h \cdot \sum_{j=0}^{k} y_j$, so this looks like a binomial random variable. Then, seeing as $y_j \in \{1, 0\}$, with even probability, picking 32 $y_j$s (or whatever the word size if of the computer) is equivalent to picking a 32 bit integer with uniform distribution over the integer's full scale.