Algorithm: LSM Algorithem for American Option Pricing

Require: n = The number of time steps, N = The number of paths, m = The number of basis, r = The riskless interest rate, S = The matrix of simulated paths($size(S) = [N, n]$), H = Barrier.

Ensure: V_0 = The price of American option

$V \leftarrow h_L(S(:, L))$

$Time \leftarrow$ a vector that all components are equal to n ($length(Time) = N$)

for $i = n - 1$ to 1 **do**

$\alpha \leftarrow (A^T A)^{-1} A\ ydata$

$\hat{C} \leftarrow A\alpha$

$lx \leftarrow$ length($xdata$) Update V and $Time$:

for $j = 1$ to lx **do**

if $\hat{C}_j \geqslant (h)_j(xdata_j)$ **then**

set the elements of V and $Time$ corresponding to $xdata_j$ to $\hat{C}_j$ and i respectively

end if