```
(* Lax-Wendroff Finite Difference Method *)

(* Given Conditions *)
Δx = 5;
Δt = 0.0015;
α = 300; c = α * Δt / Δx;
A = ConstantArray[0, {α, α}];
v0 = {}; z = {};

(* Diagonalizing Matrix A *)
For[i = 1, i ≤ α, i++,
  A[[i, i]] = 1 - c^2;
 ];

For[i = 2, i ≤ α, i++,
  A[[i - 1, i]] = c * (c - 1) / 2;
  A[[i, i - 1]] = c * (c + 1) / 2;
 ];

(* Creating Initial State Vector *)
For[i = 1, i ≤ α, i++,
  If[i ≥ 50 && i ≤ 110,
    AppendTo[v0, 100 * Sin[Pi * (i - 50) / 60]], AppendTo[v0, 0]
   ];
 ];

(* Loops previos state vector to get next state vector*)
For[i = 1, i ≤ α, i++,
  vi = A.vi-1;
  vi = ReplacePart[vi, 1 → 0];
  vi = ReplacePart[vi, 300 → 0];
 ];

(* Creating a listplot for all vectors *)
For[k = 0, k ≤ 300, k++,
  pk = ListPlot[vk, PlotRange → all, PlotLabel → "Points", AxesLabel → {"Space", "Time"}];
 ];

(* Creating 1x300 (1,2,3....300) vector to transpose with state vectors*)
For[j = 1, j ≤ 300, j++,
  AppendTo[z, j];
 ];

(* Transposing all state vectors to line up plot points *)
For[m = 0, m ≤ 300, m++,
  gm = Transpose[{z, vm}];
 ];

(* B-splining every vector *)
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For[t = 0, t ≤ 300, t++,
  s_t = Graphics[{BSplineCurve[g_t]}];
 ];
```

```
Show[{s_0, p_0}, {s_60, p_60}, {s_120, p_120}, {s_180, p_180}, {s_240, p_240}, {s_300, p_300}, Axes → True]
```