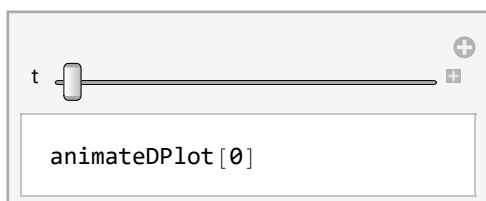


```
(* https://aha.betterexplained.com/t/convolution/679 *)
plan[0] = 3;
plan[1] = 2;
plan[2] = 1;
plan[x_] := 0;
patients[1] = 1;
patients[2] = 2;
patients[3] = 3;
patients[4] = 4;
patients[5] = 5;
patients[x_] := 0;

f[x_] := { -x + 3  x ≥ 0 && x ≤ 2 ;
          0      True
};
g[x_] := { x  x ≥ 1 && x ≤ 5 ;
          0  True
};
conv[x_] := Sum[plan[i] * patients[-i + x], {i, 0, 2}];
convC = Convolve[f[x], g[x], x, y]
{ -10/3 + 4 y          3 < y ≤ 5
  1/6 (-11 + 3 y + 9 y^2 - y^3)  1 < y ≤ 3
  1/6 (455 - 51 y - 9 y^2 + y^3)  5 < y < 7
  0                               True
};
convInterpolated = Interpolation[Table[conv[x], {x, 0, 10}], InterpolationOrder → 1,
  "ExtrapolationHandler" → {(Indeterminate &), "WarningMessage" → False}];
animatedDPlot[t_] := Show[
  Plot[{f[x], g[-x + t], { convInterpolated[x + 1]  x ≤ t
                        Undefined True }}, {x, -2, 10},
    PlotRange → {0, 28},
    PlotLabel → "t = " <> ToString[t],
    AxesLabel → {"t, τ"},
    ImageSize → 500
  ],
  DiscretePlot[{plan[x], patients[-x + t], { conv[x]  x ≤ t
                        Undefined True }}, {x, -2, 10},
    PlotLegends → {"Plan[τ]", "Patients[-τ+t]", "(Plan*Patients)[t]"},
    PlotRange → {0, 28}
  ]
];
Manipulate[
  animatedDPlot[t]
, {t, 0, 16, 1}]
```

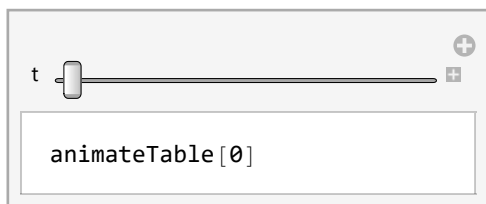


```

animateTable[t_] := Grid[{
  {"Plan", plan[0], plan[1], plan[2], plan[3], plan[4]},
  {"Patients", patients[t], patients[t - 1], patients[t - 2],
   patients[t - 3], patients[t - 4], "*"}, {"t=" <> ToString[t],
   plan[0] * patients[t], plan[1] * patients[t - 1], plan[2] * patients[t - 2],
   plan[3] * patients[t - 3], plan[4] * patients[t - 4], "Σ " <> ToString[conv[t]]}
},
  Dividers → {{False, False, False, False, False, False, True}, {False, False, True}},
  ItemSize → {{Automatic, 1, 1, 1, 1, 1, 3}, {Automatic, Automatic, 1.8}}
];

m = Manipulate[
  animateTable[t]
, {t, 0, 10, 1}
]

```



```

(*Export[FileNameJoin[{NotebookDirectory[], "frames/t=00.png"}],
  Table[animateTable[t], {t, 0, 10, 1}], "VideoFrames",
  ImageSize→500, Antialiasing→True];*)

(*Export[FileNameJoin[{NotebookDirectory[], "frames/t=00.png"}],
  Table[animateDPlot[t], {t, 0, 16, 1}], "VideoFrames", Antialiasing→True];*)

Show[
  DiscretePlot[conv[x], {x, 0, 9}],
  Plot[convC /. {y → x}, {x, 0, 9}]
]

```

