In[ ]:=
```
nGrid = 10 + 1; Δy = 1/(nGrid - 1);
y = Table[(i - 1) Δy, {i, 1, nGrid}];
u = Array["u", nGrid];
```

In[ ]:=
```
discreteEqns = Table[u[[i + 1]] - 2 u[[i]] + u[[i - 1]] == 0, {i, 2, nGrid - 1}];
```

In[ ]:=
```
bcs = {u[[1]] == 0, u[[nGrid]] == 10}
```

Out[ ]=
```
{u[1] == 0, u[11] == 10}
```

In[ ]:=
```
eqns = Join[discreteEqns, bcs];
```

In[ ]:=
```
sol = NSolve[eqns, u];
```

In[ ]:=
```
uVals = u /. sol;
data = Table[{y[[i]], uVals[[1]][[i]]}, {i, nGrid}];
```

Out[ ]=
$$\left\{\{0, 0.\}, \left\{\frac{1}{10}, 1.\right\}, \left\{\frac{1}{5}, 2.\right\}, \left\{\frac{3}{10}, 3.\right\}, \left\{\frac{2}{5}, 4.\right\}, \left\{\frac{1}{2}, 5.\right\}, \left\{\frac{3}{5}, 6.\right\}, \left\{\frac{7}{10}, 7.\right\}, \left\{\frac{4}{5}, 8.\right\}, \left\{\frac{9}{10}, 9.\right\}, \{1, 10.\}\right\}$$

In[ ]:=
```
ListLinePlot[data, PlotMarkers → Automatic,
 AxesLabel → {"Index", "u"}, PlotLabel → "u(y)"]
```

Out[ ]=