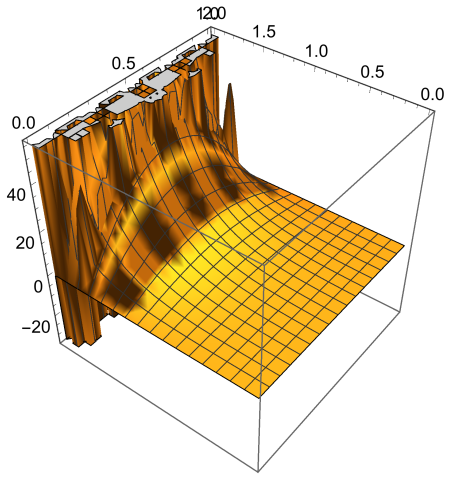
In[331]:=

```
Clear[u, phi, psi, z, y, a, b, c, d, n, x, L, f, g]
L := 1
H := 2
nTerms := 10
f[x_] := x (1 - x)
g[x_] := 100
c[n_] := 2 ∫_0^L f[x] Sin[π n x / L] dx / L
d[n_] := (2 ∫_0^L g[x] Sin[π n x / L] dx / L - c[n] Cosh[π H n / L]) / Sinh[π H n / L]
phi[x_, n_] := Sin[π n x / L]
psi[y_, n_] := c[n] Cosh[π n y / L] + d[n] Sinh[π n y / L]
u[x_, y_, M_] := Sum_{n=1}^{M} (phi[x, n] psi[y, n])
z[x_, y_] := Evaluate[u[x, y, nTerms]]
z[x, y];
Plot3D[z[x, y], {x, 0, L}, {y, 0, H}, BoxRatios → {1, 1, 1}]
```

Out[344]=



$$\text{Sin}[\pi x]\left(\frac{8\,\text{Cosh}[\pi y]}{\pi^3}+\left(\frac{400}{\pi}-\frac{8\,\text{Cosh}[2\pi]}{\pi^3}\right)\text{Csch}[2\pi]\,\text{Sinh}[\pi y]\right)+$$
$$\text{Sin}[3\pi x]\left(\frac{8\,\text{Cosh}[3\pi y]}{27\,\pi^3}+\left(\frac{400}{3\pi}-\frac{8\,\text{Cosh}[6\pi]}{27\,\pi^3}\right)\text{Csch}[6\pi]\,\text{Sinh}[3\pi y]\right)+$$
$$\text{Sin}[5\pi x]\left(\frac{8\,\text{Cosh}[5\pi y]}{125\,\pi^3}+\left(\frac{80}{\pi}-\frac{8\,\text{Cosh}[10\pi]}{125\,\pi^3}\right)\text{Csch}[10\pi]\,\text{Sinh}[5\pi y]\right)+$$
$$\text{Sin}[7\pi x]\left(\frac{8\,\text{Cosh}[7\pi y]}{343\,\pi^3}+\left(\frac{400}{7\pi}-\frac{8\,\text{Cosh}[14\pi]}{343\,\pi^3}\right)\text{Csch}[14\pi]\,\text{Sinh}[7\pi y]\right)$$