

```

In[362]:= Clear[a, b, c, n, m, f, g, x, y, t, h]
c := 0.5
L := 10
H := 10
f[x_, y_] := 10 x (10 - x) (10 - y) Cos[x] Cos[y]
g[x_, y_] := -1
nTerms := 5

lambda[m_, n_] :=  $\left(\frac{\pi m}{H}\right)^2 + \left(\frac{\pi n}{L}\right)^2$ 

phi[x_, n_] := Sin $\left[\frac{\pi n x}{L}\right]$ 

psi[y_, m_] := Sin $\left[\frac{\pi m y}{H}\right]$ 

A[m_, n_] := 
$$\frac{4 \int_0^L \left( \int_0^H f[x, y] \text{psi}[y, m] \text{phi}[x, n] \, dy \right) dx}{H L}$$


B[m_, n_] := 
$$\frac{4 \int_0^L \left( \int_0^H g[x, y] \text{psi}[y, m] \text{phi}[x, n] \, dy \right) dx}{c H L \sqrt{\text{lambda}[m, n]}}$$

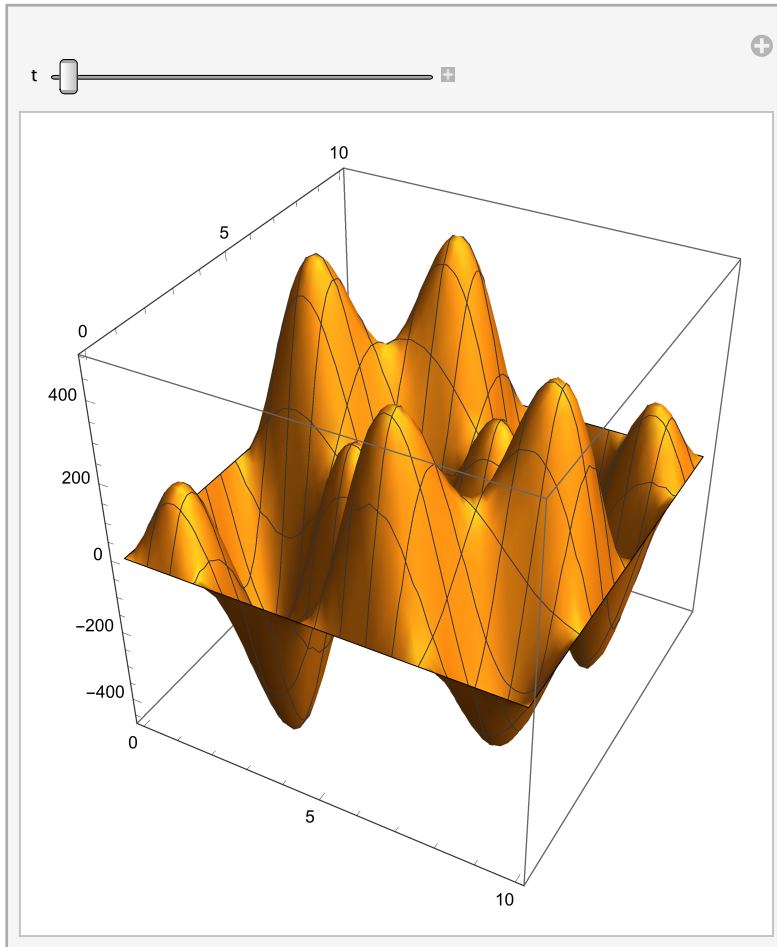

ht[m_, n_, t_] := A[m, n] Cos $\left[c t \sqrt{\text{lambda}[m, n]}\right] + B[m, n] \text{Sin}\left[c t \sqrt{\text{lambda}[m, n]}\right]$ 

u[x_, y_, t_, M_, N_] :=
Sum[Sum[phi[x, n] * psi[y, n] * ht[m, n, t], {n, 1, N}], {m, 1, M}]

z[x_, y_, t_] := Evaluate[u[x, y, t, nTerms, nTerms]]

```

```
Manipulate[Plot3D[Evaluate[z[x, y, t]], {x, 0, L}, {y, 0, H},  
  BoxRatios -> {1, 1, 1}, PlotRange -> Automatic], {t, 0, 3.6, 0.3}]
```



In[377]:= **Manipulate**[**ContourPlot**[**Evaluate**[**z**[**x**, **y**, **t**]], {**x**, 0, **L**}, {**y**, 0, **H**}, {**t**, 0, 3.6, 0.3}]

Out[377]=

