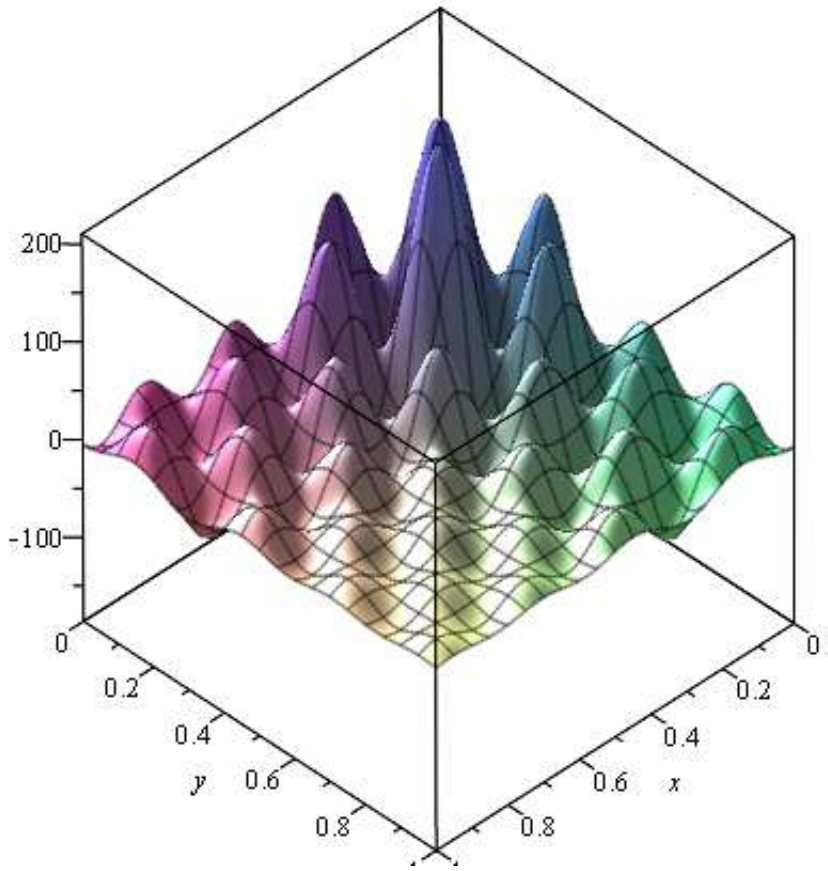
```
> with(plots):
> #https://www.sfu.ca/~ssurjano/optimization.html
  # Shubert function
> f := x -> (sum(i*cos((i+1)*(-2+4*x[1])+i), i=1..5))*(sum(i*cos((i+1)*(-2+4*x[2])+i), i=1..5))
```

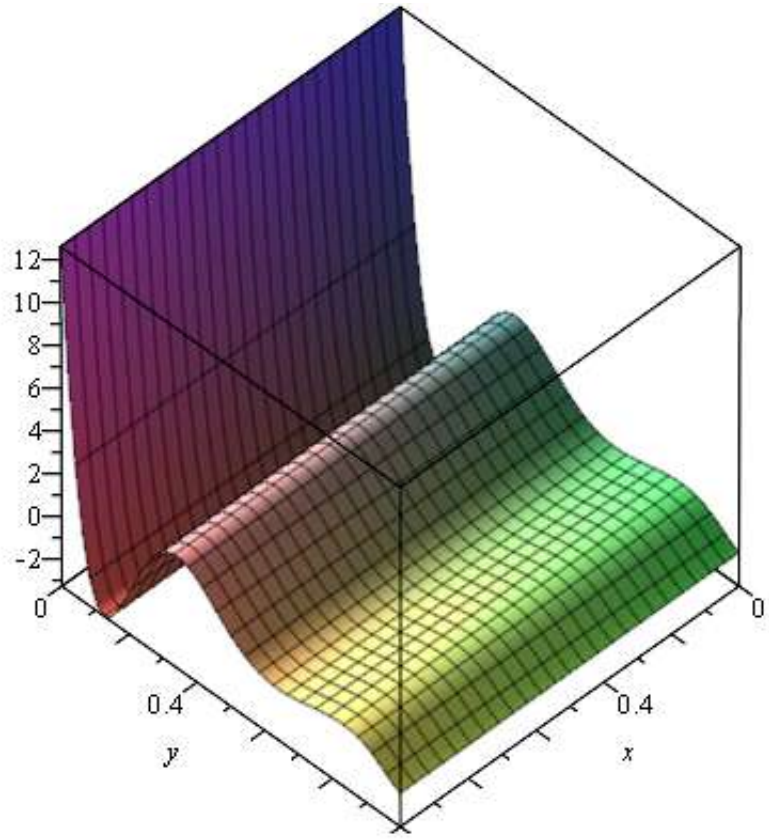
$$f := x \to \left(\sum_{i=1}^{5} i\cdot\cos((i+1)\cdot(-2+4\cdot x[1])+i)\right)\cdot\left(\sum_{i=1}^{5} i\cdot\cos((i+1)\cdot(-2+4\cdot x[2])+i)\right)$$

$$f := x \to \left(\sum_{i=1}^{5} i\cos\left((i+1)\left(-2+4x_1\right)+i\right)\right)\left(\sum_{i=1}^{5} i\cos\left((i+1)\left(-2+4x_2\right)+i\right)\right) \quad (1)$$

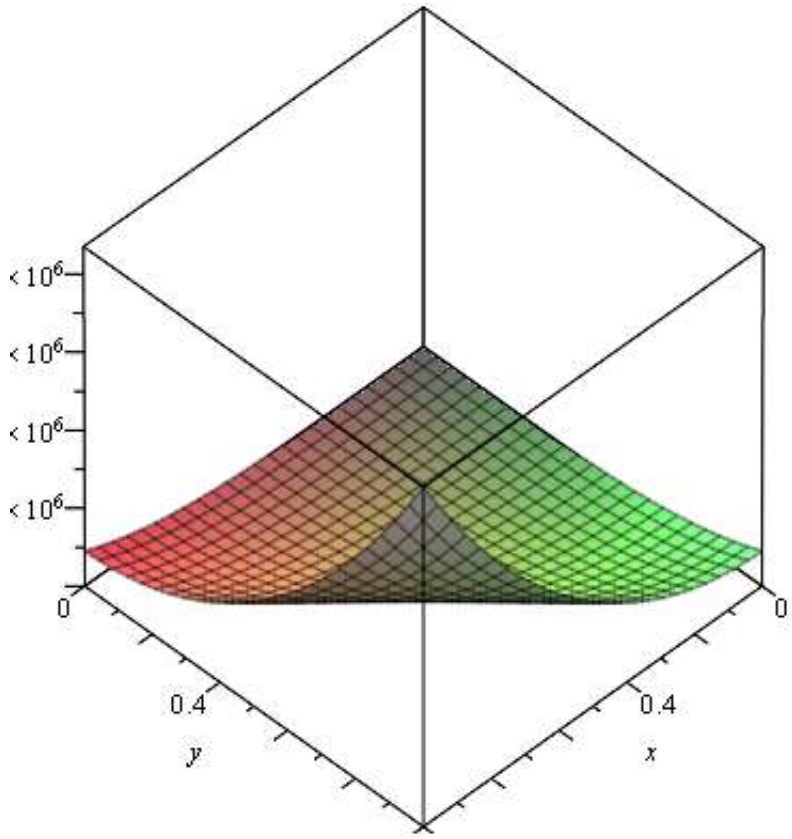
```
> plot3d(f([x, y]), x=0..1, y=0..1, numpoints=10000)
```




```
>
> N := 10 : M := 10 : p := x -> sum(sum(f([i/N, k/M])*binomial(N, i)*x[1]^i*(1-x[1])^(N-i)*binomial(M, k)*x[2]^k*(1-x[2])^(M-k), k=0..M), i=0..N):
> plot3d(p([x, y]), x=0..1, y=0..1)
```



> $plot3d(mtaylor(f([x,y]),[x=0,y=0],5),x=0..1,y=0..1)$


$< 10^6$
$< 10^6$
$< 10^6$
$< 10^6$
0
0.4
y
0
0.4
x

>

>