

```

x = Flatten[Table[x^n y^m z^k a^l, {n, 0, 1}, {m, 0, 1}, {k, 0, 1}, {l, 0, 1}]];
{1, a, z, a z, y, a y, y z, a y z, x, a x, x z, a x z, x y, a x y, x y z, a x y z}

M = Flatten[Table[{a, b, c, d}, {a, 0, 1}, {b, 0, 1}, {c, 0, 1}, {d, 0, 1}], 3];
M // MatrixForm

(0 0 0 0
 0 0 0 1
 0 0 1 0
 0 0 1 1
 0 1 0 0
 0 1 0 1
 0 1 1 0
 0 1 1 1
 1 0 0 0
 1 0 0 1
 1 0 1 0
 1 0 1 1
 1 1 0 0
 1 1 0 1
 1 1 1 0
 1 1 1 1)

Table[h /. x → M[[i, 1]] /. y → M[[i, 2]] /. z → M[[i, 3]] /. a → M[[i, 4]], {i, 16}] ///
MatrixForm

(1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0
 1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0
 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0
 1 1 0 0 1 1 0 0 0 0 0 0 0 0 0 0
 1 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0
 1 1 1 1 1 1 1 1 0 0 0 0 0 0 0 0
 1 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
 1 1 0 0 0 0 0 0 1 1 0 0 0 0 0 0
 1 0 1 0 0 0 0 0 1 0 1 0 0 0 0 0
 1 1 1 1 0 0 0 0 1 1 1 1 0 0 0 0
 1 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0
 1 1 0 0 1 1 0 0 1 1 0 0 1 1 0 0
 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0
 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1)

```

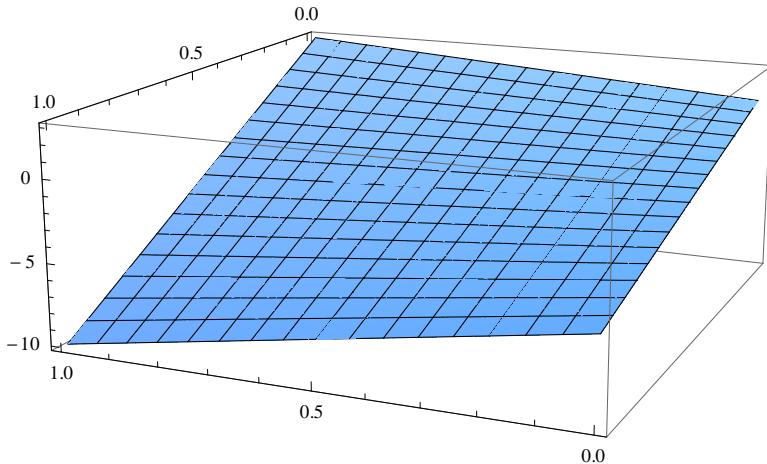
```

Co = Inverse[
  Transpose[Table[h /. x → M[[i, 1]] /. y → M[[i, 2]] /. z → M[[i, 3]] /. a → M[[i, 4]],
  {i, 16}]]]; Co // MatrixForm


$$\begin{pmatrix} 1 & -1 & -1 & 1 & -1 & 1 & 1 & -1 & -1 & 1 & 1 & -1 & 1 & -1 & -1 & 1 \\ 0 & 1 & 0 & -1 & 0 & -1 & 0 & 1 & 0 & -1 & 0 & 1 & 0 & 1 & 0 & -1 \\ 0 & 0 & 1 & -1 & 0 & 0 & -1 & 1 & 0 & 0 & -1 & 1 & 0 & 0 & 1 & -1 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & -1 & 0 & 0 & 0 & -1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & -1 & -1 & 1 & 0 & 0 & 0 & 0 & -1 & 1 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & -1 & 0 & 0 & 0 & 0 & 0 & -1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & -1 & 0 & 0 & 0 & 0 & 0 & 0 & -1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -1 & 0 & 0 & 0 & 0 & 0 & -1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -1 & -1 & 1 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & -1 & 0 & -1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & -1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & -1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & -1 \end{pmatrix}$$


s = {1, 0, 0, 0, -5, 0, 0, 0, 3, 0, 0, 0, -10};
Plot3D[h.Sum[Co[[i]] * s[[i]], {i, Length[s]}] /. z → 0 /. a → 0, {x, 0, 1}, {y, 0, 1}]

```



```

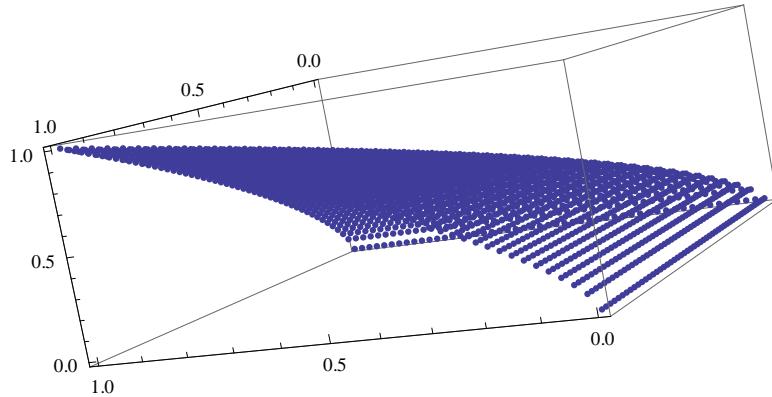
f[a0_, b0_] := Module[{a = a0, b = b0, x, y, h, s},
  S = Select[M2, (#[[1]] == a && #[[2]] == b) &];
  If[Length[S] ≠ 0,
    S[[1, 3]],
    h = {1, y, x, x y};
    Transpose[#[[3]].Co.h /. x → (a - #[[1, 1]]) / (#[[3, 1]] - #[[1, 1]]) /.
      y → (b - #[[1, 2]]) / (#[[2, 2]] - #[[1, 2]]) &[
      Select[M2, (Abs[#[[1]] - a] < 1/nx && Abs[#[[2]] - b] < 1/ny) &]]]
  ]

```

```

A = 20; nx = 50; ny = 50; of = 0.00001;
M2 = Flatten[Table[{x / nx + of, y / ny + of, f2[x / nx + of, y / ny + of, 0.999, A]}, {x, 0, nx}, {y, 0, ny}] // N, 1];
ListPointPlot3D[M2]

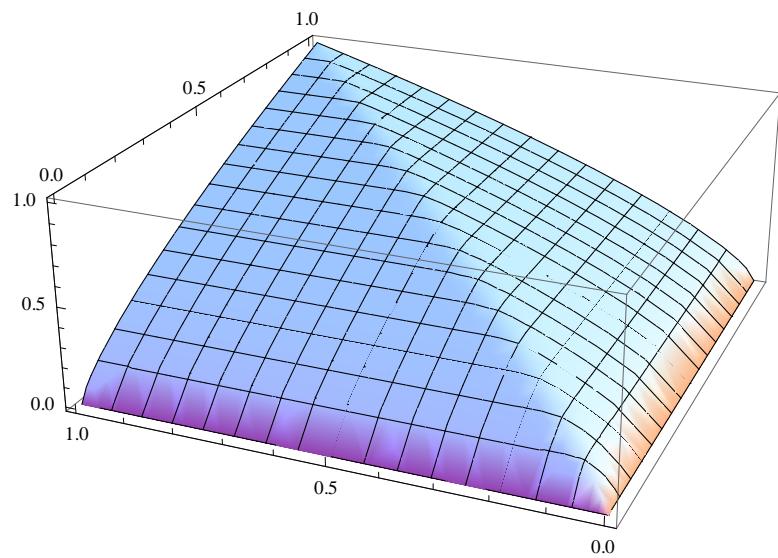
```



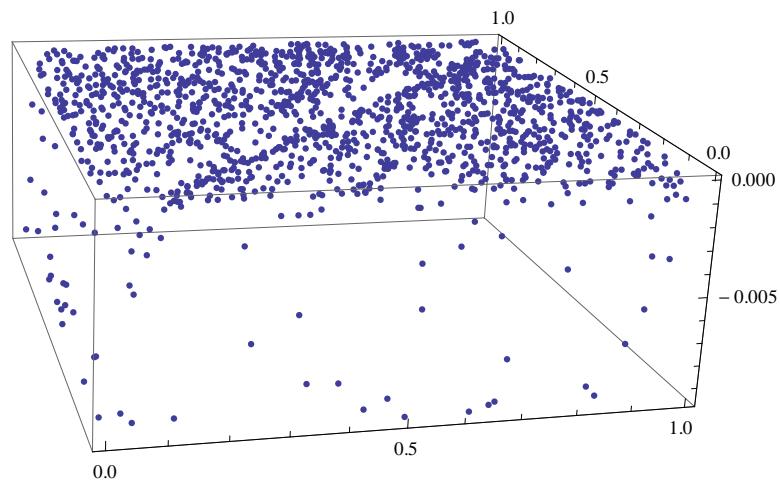
```

{#1, #2, f[#1, #2]} & @@@ RandomReal[1, {5, 2}]
{{0.973702, 0.421533, 0.553827},
 {0.726423, 0.644939, 0.740655}, {0.148565, 0.798155, 0.27169},
 {0.980137, 0.85688, 0.899651}, {0.79674, 0.646281, 0.741737}}
tt = {#1, #2, f[#1, #2]} & @@@ RandomReal[1, {1500, 2}];

```

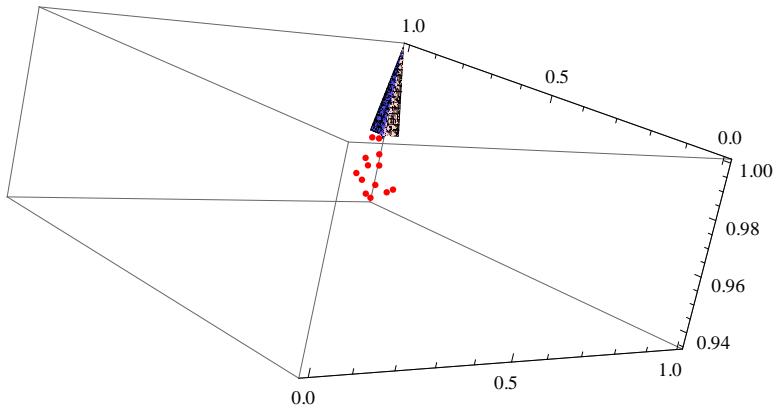


```
ttt = Sort[Table[{tt[[i, 1]], tt[[i, 2]],
  (tt[[i, 3]] - f2[tt[[i, 1]], tt[[i, 2]], 0.999, A])}, {i, 1, Length[tt]}]];
ListPointPlot3D[ttt, PlotRange -> All]
```



```
ttt[[100]]
-0.0010872
```

```
Show[ListPointPlot3D[tt, PlotStyle -> Red],  
Plot3D[f2[x, y, 0.999, A], {x, .95, 1}, {y, .95, 1}]]
```



```
p[k_] := 250! / k! / (250 - k)! * 0.04^k * (1 - 0.04)^(250 - k)  
Sum[p[i], {i, 0, 5}]  
0.0632933
```