Tests of generators of (pseudo)random numbers

Clear all symbols from previous evaluations to avoid problems

In[1]:=
```
Clear["Global`*"]
```

Tests of generators of pseudorandom numbers

Linear congruent generator

Pseudorandom numbers are generated by

$$x_{i+1} = (a\, x_i + c) \bmod m \tag{1}$$

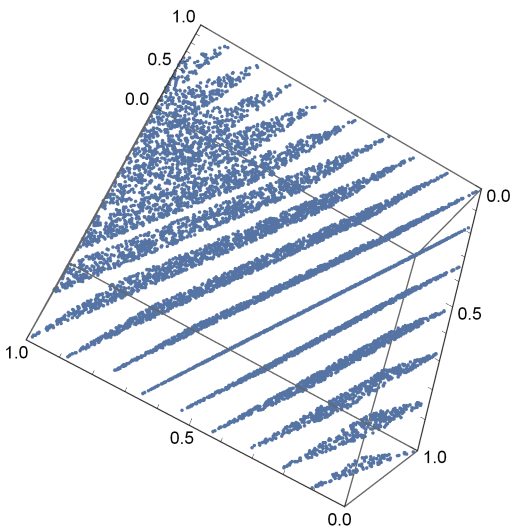
According to the choice of a, c, m, and x_0 we get pseudorandom number generators of different quality

In[2]:=
```
xRandom = 1;
myRandom[n_, dim_, par_] := Module[{out = ConstantArray[0, {n, dim}]},
   Do[
    Do[
     xRandom = Mod[par[[1]] xRandom + par[[2]], par[[3]]];
     out[[i, j]] = xRandom,
     {j, 1, dim}],
    {i, 1, n}
   ];
   Return[out]
  ];
```

Generator RANDU:

In[4]:=
```
p = 31;
ListPointPlot3D[myRandom[10000, 3, {2^16 + 3, 0, 2^p}] / 2^p,
 PlotStyle → PointSize[Small], PlotRange → {{0, 1}, {0, 1}, {0, 1}}]
```

Out[5]=

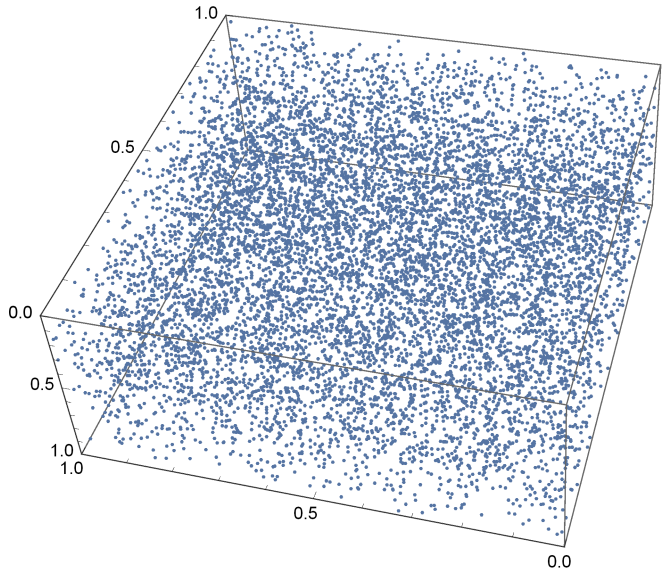


Generator from Apple CarbonLib:

In[6]:=
```
m = 2^31 - 1;
xRandom = 1;
N[(3 ! m)^(1/3)]
ListPointPlot3D[myRandom[10000, 3, {16807, 0, m}] / m,
 PlotStyle → PointSize[Small], PlotRange → {{0, 1}, {0, 1}, {0, 1}}]
```

Out[8]= 2344.374768

Out[9]=



Mathematica's LCG generator:

In[10]:=
```
SeedRandom[1, Method → "Congruential"];
ListPointPlot3D[RandomReal[{0, 1}, {10000, 3}],
 PlotStyle → PointSize[Small], PlotRange → {{0, 1}, {0, 1}, {0, 1}}]
```

Out[11]=