Scientific Visualization I
Assignment 3
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1. *Cartesian Grids*

   Cartesian Grids can be useful in spaces with less or more dimensions than three. In the lecture you heard about indexing in these grids. Please provide a formula or code for mapping a 4D point in normalized coordinates $x \in [0 \ldots 1)^4$ *to a global cell index for a structured Cartesian grid of size* $N_x \cdot N_y \cdot N_z \cdot N_w$.

   For example, the point (0.46, 0.57, 0.23, 0.68) in a grid of size $128 \cdot 64 \cdot 32 \cdot 16$ *should be mapped to index 2683450.*

   Let a 4D point (i, j, k, l) in normalized coordinates maps to a structured Cartesian grid of size $N_x \cdot N_y \cdot N_z \cdot N_w$, the global cell index would be:

   $$Index = \lfloor i \cdot Nx \rfloor + \lfloor j \cdot Ny \rfloor \cdot Nx + \lfloor k \cdot Nz \rfloor \cdot Nx \cdot Ny + \lfloor l \cdot Nw \rfloor \cdot Nx \cdot Ny \cdot Nz$$

2. *ParaView Introduction: Point Splatting*

   The file exercise_02.cxx is provided in the same folder. It produces correct results.